Revitalizing Auto Communities Environmental Response (RACER) Trust

2023 ANNUAL MONITORING REPORT

RACER Trust Lansing Industrial Land

Lansing, Michigan

June 27, 2024

2023 Annual Monitoring Report

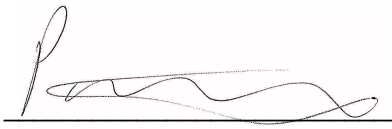
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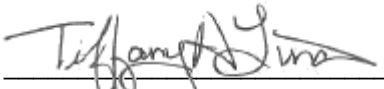
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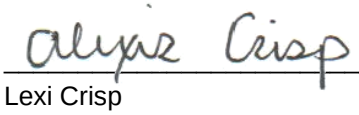
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Acronyms and Abbreviations

Annual Report	2023 Annual Groundwater Monitoring Report
APC Site	former Adam's Plating Company Superfund Site
Arcadis	Arcadis of Michigan, LLC
bgs	below ground surface
COC	constituent of concern
CSM	Conceptual Site Model
DW criteria	Part 201 Residential Drinking Water Criteria
EGLE	Michigan Department of Environment, Great Lakes, and Energy
FSP	Field Sampling Plan
ft	feet
ft/ft	foot per foot
GSI criteria	Groundwater-Surface Water Interface Criteria
IGMP	Revised Interim Groundwater Monitoring Work Plan
LNAPL	light nonaqueous phase liquid
µg/L	microgram per liter
Merit	Merit Laboratories located in Lansing, Michigan
mg/L	milligram per liter
ng/L	nanogram per liter
NTU	nephelometric turbidity unit
Pace	Pace Analytical located in West Columbia, South Carolina
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
QC	quality control
RACER	Revitalizing Auto Communities Environmental Response
RCRA	Resource Conservation and Recovery Act

RL	reporting limit
RRD	Remediation and Redevelopment Act
SIM	selected ion monitoring
Site	RACER Trust Plants 2, 3, and 6 located in Lansing, Michigan
SOP	Standard Operating Procedure
SVOC	semi-volatile organic compound
TestAmerica	TestAmerica Laboratories, Inc. located in Burlington, Vermont
USEPA	United States Environmental Protection Agency
VAP	vertical aquifer profiling
VOC	volatile organic compound

1 Introduction

On behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust, Arcadis of Michigan, LLC (Arcadis) prepared this 2023 Annual Groundwater Monitoring Report (Annual Report) to support the Resource Conservation and Recovery Act (RCRA) Corrective Action process for RACER Trust Lansing Industrial Land, located in Lansing, Michigan (Site). The Site consists of former Plants 2, 3, and 6. This Annual Report summarizes groundwater monitoring completed between January and December 2023, consistent with the requirements of the Revised Interim Groundwater Monitoring Work Plan (IGMP; Arcadis 2019, as revised), which was approved by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on July 25, 2019. The IGMP was further revised in 2023 and revisions were approved by EGLE on April 20, 2023 (Arcadis 2023a). The 2023 Revised IGMP incorporated storm sewer monitoring; newly installed monitoring wells; and adjusted the number of wells, constituents, and frequency of sampling consistent with the evolving risk and regulatory requirements, as approved by EGLE.

The following sampling events were completed in accordance with the 2019 Revised IGMP:

- First quarter 2023 – A quarterly groundwater sampling and gauging event completed February 13 through February 17, 2023. Gauging was completed at 57 monitoring wells and groundwater samples were collected from a total of 53 monitoring wells.

The following sampling events were completed in accordance with the 2023 Revised IGMP:

- Second quarter 2023 – Gauging of light non-aqueous phase liquid (LNAPL) wells and quarterly and semi-annual groundwater sampling and gauging event completed May 15 through 25, 2023. Groundwater gauging was completed on a total of 233 monitoring wells (22 of which were LNAPL monitoring wells), and groundwater samples were collected from a total of 83 wells.
- Third quarter 2023 – A quarterly groundwater sampling and gauging event completed August 28 through August 30, 2023. Groundwater elevations were collected from a total of 39 monitoring wells and groundwater samples were collected from a total of 36 wells.
- Fourth quarter 2023 – Site-wide gauging, including LNAPL well gauging, were completed between October 23 through November 4, 2023, in addition to a quarterly, semi-annual, and annual groundwater sampling event. Annual sampling of Lansing Township municipal wells was also completed during the fourth quarter. Groundwater elevations were collected from a total of 234 monitoring wells (22 of which were LNAPL monitoring wells), and groundwater samples were collected from a total of 143 wells.
- Additionally, storm sewer sampling for PFAS was completed during each 2023 quarterly event on February 7, April 25, July 25, and October 24.

As outlined in the 2019 and 2023 Revised IGMP, this Annual Report includes quarterly data (e.g., tabulated data, figures, analytical narrative) and the following information:

- Objective and scope of the sampling events
- Summary of groundwater elevations and LNAPL gauging data, including contour maps and trend plots
- Figures, tables, and a brief narrative summarizing the groundwater sampling results
- Groundwater elevation contour maps for various water bearing zones
- Updated groundwater plume stability evaluation
- Summary of Lansing Township water supply well sampling
- Conclusions and recommendations for revisions to the IGMP as appropriate.

All groundwater monitoring activities were completed in accordance with the 2019 and 2023 Revised IGMP. The sampling frequencies and analytes for each well in the 2019 Revised IGMP are included in **Table 1A** and 2023 Revised IGMP are included in **Table 1B**. The locations of all Site monitoring wells are provided on **Figures 1A**, **1B**, and **1C**.

The following deviations from the 2019 and 2023 IGMP were observed during the 2023 monitoring activities:

- **MWBP-11-UST1-4** was unable to be located in fourth quarter but was gauged in second quarter 2023. Arcadis will attempt to locate again in 2024.
- **MW-03-02** and **MW-03-04** are flush-mounted wells located in low lying areas of Plant 6 and utilized for groundwater elevation monitoring. Both monitoring wells have been unable to be located since June 2020. In 2023 Arcadis was able to locate MW-03-02 and MW-03-04 during both second and fourth quarter gauging events.
- **MW-03-08** is a perched monitoring well with flush-mount construction and was unable to be accessed due to standing water in second and fourth quarter 2023. MW-03-08 is utilized for annual groundwater elevation monitoring and biennial VOC monitoring. Arcadis will evaluate converting this well to a stick-up casing in 2024, as well as address the grade near the well to prevent future submersion.
- **MW-13-51** was gauged during the second and fourth quarter events, but the digital gauging log from the fourth quarter was not able to be located. This well is only scheduled for semi-annual gauging and will be gauged again in second quarter 2024.
- **MW-14-69** was dry in second and fourth quarter 2023 and has been dry since installation in 2014. This monitoring well was installed in an area with limited perched groundwater with the intent of verifying whether saturated conditions existed and if the well would produce enough water for sampling and is checked semi-annually.
- **MW-18-96** was installed in shallow fill material at Plant 3 and contained water during development and initial sampling; however, the well has been dry since June 2020.
- **MW-19-110** was installed in August 2019 at the request of EGLE in an area of Plant 3 with limited perched groundwater with the intent of verifying whether saturated conditions existed and if the well would produce enough water for sampling. Since installation in 2019, the well has had either low water levels or been dry, resulting in no groundwater samples collected. No samples were collected at this location in 2023.
- **MW-19-113** was installed in a sand seam encountered from 16 to 23 feet below ground surface (ft bgs) on northern Plant 3 and had approximately 7 feet of water during development and initial sampling during 2019. The water level decreased dramatically during 2020 and continued to decrease until the well contained insufficient water to collect a sample beginning in fourth quarter 2020. The last groundwater sample collected from MW-19-113 was in June 2020. Low water levels were present during the second and fourth quarter 2023 gauging events (0.27 to 0.11 feet of water column, respectively). No samples were collected from this location in 2023.
- **MW-22-159** was installed from 26 to 31 ft bgs in a perched clay unit with a sand lens from 28.5 to 29 ft bgs. Since installation in September 2022, this location has been dry and has not been sampled.
- **TW-14-06** was observed to be damaged in first quarter 2023 and unable to be sampled. TW-15-11 was used as a replacement for first quarter and future sampling. Well TW-14-06 was part of the Biosparge system and had a damaged well seal that was affecting remedy performance. TW-14-06 was approved by EGLE for abandonment in early 2024 and was abandoned on February 2, 2024.

2 Sampling Methods

This section discusses the groundwater and storm sewer sampling methodology used at the Site.

2.1 Groundwater Sampling Methods

All groundwater samples were collected in a manner consistent with the low-flow sampling techniques in the Arcadis Standard Operating Procedure (SOP) for low-flow sample collection, and generally consistent with EGLE's Remediation and Redevelopment Division (RRD) Op Memo 2, Attachment 5 (EGLE 2004). Samples collected for 1,4-dioxane, VOCs, and general chemistry were submitted under chain of custody protocol to Merit Laboratories (Merit) located in East Lansing, Michigan. Samples collected for low-concentration 1,4-dioxane analysis were submitted under chain of custody protocol to Eurofins Laboratory in Barberton, Ohio. Samples collected for PFAS analyses were submitted under chain of custody protocol to Pace Analytical Laboratory located in West Columbia, South Carolina. Laboratory analytical reports and data validation reports for Lansing Township municipal wells and all other monitoring wells are included as **Appendix A** and **B-1**, respectively. Groundwater low-flow sampling logs are included as **Appendix C-1**.

During the second and fourth quarter 2023 semi-annual sampling events, and before sample collection, site-wide gauging was completed using electronic water level meters and LNAPL wells were gauged using an oil/water interface probe. During first and third quarter 2023 sampling events, gauging was limited to those wells selected for sampling. All gauging was completed within 24 hours with few exceptions due to access or other issues.

The most current sampling matrix provided as part of the 2023 Revised IGMP is included as **Table 1B**. In general, groundwater samples were submitted for analysis for one or more of the following parameters:

- Target compound list (TCL) VOCs using United States Environmental Protection Agency (USEPA) Method SW8260B, Revision 2 or SW8260C, Revision 3.
- Low-concentration 1,4-dioxane using USEPA Drinking Water Method 522, which provides a reporting limit (RL) of 0.20 microgram per liter (µg/L) – used for the Lansing Township municipal wells and select bedrock monitoring wells.
- 1,4-Dioxane using USEPA Method SW8260B-SIM – used for monitoring wells other than municipal and bedrock wells.
- PFAS using USEPA Method 537 modified with isotope dilution (DoD QSM 5.3).

2.1.1 Quality Control/Quality Assurance

Quality control (QC) samples were collected during the sampling event and included the following:

- One duplicate sample per every ten samples.
- One matrix spike and matrix spike duplicate (MS/MSD) sample per every 20 samples.
- One field blank sample per sampler per sampling event.
- One equipment blank sample per pump per sampling event, as well as additional equipment blank samples from the water level meters used for PFAS sampling.

Additionally, trip blanks were included with each cooler containing samples for VOC analysis. One sample delivery group per plant from each quarter underwent complete Tier I validation as defined in USEPA *Innovative Approaches to Data Validation*, USEPA Region III (USEPA 1995). Groundwater sample validation reports are included in **Appendix A** and **B-1** along with laboratory analytical reports.

2.1.2 Light Nonaqueous Phase Liquid Monitoring

LNAPL monitoring wells were gauged during the second and fourth quarter events with an oil/water interface probe. Gauging methods were consistent with the 2019 and 2023 revised IGMP (Arcadis 2019; 2023e).

2.2 Soil Vapor Monitoring

Soil vapor monitoring point SVMP-20-01 is located near the Plant 6 entrance for the purpose of monitoring VOCs in soil vapor potentially associated with the low concentration vinyl chloride plume located in this area. Details regarding the vapor intrusion assessment for this area were included in the Plant 6 Vapor Intrusion Investigation Summary report (Arcadis 2022c).

Soil vapor monitoring point SVMP-20-01 was sampled on February 14, May 1, August 29, and October 27, 2023, for USEPA Method TO-15 analysis. Soil gas laboratory analytical reports are provided in **Appendix B-2** and sampling logs are provided in **Appendix C-2**. The location of SVMP-20-01 is included on **Figure 1B**. A helium leak test was performed prior to each sampling event and the soil gas samples were collected in a laboratory-provided Bottle Vac and submitted to Fibertec Analytical Laboratory in Holt, Michigan for analysis.

2.3 Groundwater Elevation Monitoring

Monitoring wells were gauged during sampling using an electronic water level meter generally within a 24-hour period. To evaluate seasonality, site-wide gauging was previously rotated annually between the second quarter and fourth quarter events. However, in 2023 site-wide gauging was completed during second and fourth quarter semi-annual sampling events. During first and third quarter sampling events, gauging was limited to those wells selected for sampling. Gauging methods were consistent with the 2019 and 2023 revised IGMP (Arcadis 2019; 2023a).

2.4 Storm Sewer Sampling Methods

Storm sewer sampling was completed quarterly to confirm the effectiveness of storm sewer modifications and abandonments completed in Fall 2018, Winter 2019/2020, Fall 2020, Spring 2021, and Fall 2023 (Arcadis 2021c). Storm sewer sampling was completed prior to storm sewer modifications and abandonments in 2017 at Plant 2 and in 2019 on Plants 2 and 6. Storm sewer samples required for quarterly monitoring are collected from the sump of the structure. Past samples collected for investigation purposes were collected from sumps and individual inverts as needed. Samples are collected according to the Arcadis Technical Guidance Instruction (TGI) for PFAS sample collection and analyzed using USEPA Method 537 modified with isotope dilution (DoD QSM 5.3).

3 Results

This section summarizes results from sampling activities completed between January and December 2023. **Table 2** presents groundwater analytical data collected during the reporting period. As a frame of reference and not indicating the criteria are applicable or that additional response is necessary, figures showing exceedances of EGLE Part 201 residential drinking water criteria (DW criteria) and Part 201 groundwater surface water interface criteria (GSI criteria), are provided as **Figures 2** through **8**. Laboratory analytical reports and data validation reports for Lansing Township municipal wells and all other monitoring wells are included as **Appendix A** and **B-1**, respectively. Groundwater low-flow sampling logs are included as **Appendix C-1**.

3.1 Groundwater Monitoring Results

A summary table of the groundwater analytical data collected during 2023 is presented in **Table 2** with exceedances of DW criteria and GSI criteria, if applicable, highlighted in gray and summarized on **Figures 2** through **8**. Results of the 2023 groundwater monitoring events are summarized below.

3.1.1 Perched 1,4-Dioxane Results

In accordance with the approved 2023 IGMP Table (**Table 1B**), sampling of perched groundwater for 1,4-dioxane was completed as part of annual groundwater sampling event during fourth quarter 2023 and quarterly at the western property boundary of Plant 2 as part of investigations described below. Perched 1,4-dioxane results (**Figure 2**) are generally consistent with the results summarized in the 2022 Annual Groundwater Monitoring Report (Arcadis 2023b), except for MW-22-157, MW-14-59, and MW-14-58R.

Monitoring well MW-14-59 is a perched monitoring well located in central Plant 2. MW-14-59 exceeded 1,4-dioxane DW Criteria during the second quarter of 2022 but was below criteria in fourth quarter of 2023.

Monitoring well MW-22-157 is a perched monitoring well located off-site, west of MW-14-58R, in the west right-of-way of Rosemary Avenue. 1,4-Dioxane was below criteria at MW-22-157 in 2022, but concentrations increased to above DW Criteria in 2023.

Monitoring well MW-14-58R is a perched monitoring well located near the western property boundary of Plant 2 and was installed in October 2021 as a replacement for MW-14-58 which was damaged and subsequently abandoned. MW-14-58 was last sampled in June 2020 and had a 1,4-dioxane concentration of 38 µg/L. MW-14-58R was installed 5 to 6 feet north of MW-14-58 within similar geology and first sampled in December 2021 with a 1,4-dioxane concentration of 430 µg/L. Continued sampling of MW-14-58R has shown decreasing 1,4-dioxane concentrations in 2023 ranging between 173 and 250 µg/L.

Additional evaluation of 1,4-dioxane in the MW-14-58R area included three vertical aquifer profile (VAP) borings, and installation of three additional monitoring wells to the north of MW-14-58R (MW-23-161, MW-23-162, and MW-23-163). The new wells were first sampled in fourth quarter 2023 and showed decreasing concentrations north of MW-14-58R. A summary of the 2023 investigation results and proposed additional monitoring activities for 2024 were included in the *MW-14-58R Area September 2023 Investigation Summary* submittal on January 19, 2024 (Arcadis 2024). Groundwater sampling for 1,4-dioxane in this area be incorporated into the revised IGMP. Sampling at MW-22-153, MW-22-155, MW-22-156, MW-22-157, MW-23-161, MW-23-162, MW-23-163 and MW-14-58R will be proposed as semi-annual.

3.1.2 Lower 1,4-Dioxane Results

A biosparge remedy has been implemented per the *Interim Measures Work Plan: Lower 1,4-Dioxane Biosparge* work plan (Arcadis 2018). The lower 1,4-dioxane (i.e., weathered bedrock) biosparge system has been operating at Plant 3 since May 2019 and Plant 2 since August 2020. Performance monitoring of the biosparge system is summarized in the *Lower 1,4-Dioxane Biosparge Update Report* most recently submitted in April 2024, and in the *Lower 1,4-Dioxane Biosparge Progress Report and Shutdown Evaluation* (Arcadis 2023c), submitted to EGLE on March 27, 2023. Lower 1,4-dioxane concentrations (**Figure 3**) have been generally decreasing throughout the footprint of the plume in 2023.

Performance monitoring demonstrates treatment of the lower 1,4-dioxane plume within the radius of influence of the biosparge wells on Plants 2 and 3, as well as downgradient flushing. Performance reporting will continue on an annual basis under a separate cover. Lower 1,4-dioxane performance monitoring wells located within the area of influence of the biosparge system (e.g., MW-13-43, MW-19-121, MW-19-123, MW-20-128, and TW-14-06) have shown decreasing to stable trends since system startup. The results at the perimeter of the lower 1,4-dioxane plume were reviewed for potential changes:

- *Southern Extent (the toe)* – The lower 1,4-dioxane plume is defined to the south by MW-16-74, MW-16-75, MW-16-77, MW-16-78, MW-19-121, MW-21-140, and MW-21-141. These results suggest no significant expansion has occurred at the southern toe of the lower 1,4-dioxane plume since 2018. Future migration to the southeast is not expected due to the operation of the biosparge system and geologic conditions described as part of the *Lower 1,4-Dioxane Conceptual Site Model* (Arcadis 2021a).
- *Northeast Lobe (on Plant 2)* – Increasing and/or stable concentrations were observed within the northeast lobe of the lower 1,4-dioxane plume on Plant 2 during 2018-2021. Since then, stable to decreasing concentrations have been observed (e.g., at wells MW-16-84 and MW-17-86), likely attributable to the operation of the biosparge system (Arcadis 2021c, 2023b). Concentrations at MW-16-85 are increasing and will continue to be monitored on a semi-annual basis. See Section 4.2.1 for more information.
- *MW-20-130*: Monitoring well MW-20-130 is a weather bedrock monitoring well that was installed as a deep sentinel for PFAS at the Plant 2 PFAS source area. MW-20-130 has a 1,4-dioxane concentration of 75 µg/L (October 2023). Two weathered bedrock monitoring wells were installed downgradient of MW-20-130, one to the south (MW-21-140) and one to the east (MW-21-141), and 1,4-dioxane was not detected at either well in 2023.
- Monitoring well MW-16-80 located near the western Plant 2 property boundary in weathered bedrock, showed a 1,4-dioxane concentration exceeding the DW criterion of 7.2 µg/L in 2023. The detected concentration was generally consistent with previous results observed at this location. As previously reported, detections of 1,4-dioxane in the weathered bedrock at the western property boundary could be associated, wholly or in part, with the APC Site.

3.1.3 Municipal Well and Bedrock Monitoring Well Sampling Results

The results of the Lansing Township well sampling indicate 1,4-dioxane concentrations of <0.20 µg/L in Lansing Township well TWP-90-03, 0.24 µg/L in TWP-90-04 and 0.36 µg/L in TWP-90-05 (**Appendix A**). These concentrations are consistent with those detected in October 2022 (0.16 J in TWP-90-03, 0.31 ng/L in TWP-90-04, not sampled at TWP-90-05 due to maintenance). The locations of the municipal wells are shown and the bedrock 1,4-dioxane results are summarized on **Figure 4.**

Analytical results for the municipal wells are included in **Table 2**. Widespread 1,4-dioxane detections are potentially related to a 1,4-dioxane “background condition” in and around Lansing, as demonstrated by the low-

level 1,4-dioxane sampling completed at the Site in 2017. Sporadic detections of 1,4-dioxane in the bedrock monitoring wells installed along the core of the plume ranged from 0.12 µg/L to 5.7 µg/L and did not exceed DW Criteria in 2023. Annual sampling of Lansing Township wells will continue to monitor for 1,4-dioxane.

3.1.4 Other VOC Results

In accordance with the approved 2019 IGMP Table (**Table 1A**), and the 2023 IGMP Table (**Table 1B**), the annual analysis of VOCs was completed during the first and fourth quarters of 2023. Of the twenty-two (22) wells that were sampled for VOCs during 2023, three (3) wells had concentrations exceeding the DW and/or GSI criteria (**Figure 5**).

- *Plant 6 entrance at the intersection of Stanley and Osborn Streets* – A vapor intrusion investigation was completed in this area and details regarding the detection of vinyl chloride in shallow groundwater in this area was provided to EGLE in the *Plant 2, 3 and Plant 6 Vapor Intrusion Investigation Summary* (Arcadis 2021b). Vinyl chloride has been detected on-site at monitoring well MW-20-131 and off-site at MW-20-132 at concentrations above the Site-Specific Vapor Intrusion to Indoor Air Criteria (SSVIAC, 0.96 µg/L). A summary of the VI evaluation was provided to EGLE in June 2022 (Arcadis 2022c). An additional monitoring well was installed in September 2022 (MW-22-154) to the northeast of MW-20-132 to define the extent of SSVIAC exceedances in groundwater. Analytical results from MW-22-154 in 2023 showed vinyl chloride ranging from non-detect (<1 µg/L) during the first and second quarter, up to 2 µg/L in the fourth quarter. Soil vapor sampling at SVMP-20-01, located between the Plant 6 entrance and the residential properties located to the northeast, has not detected vinyl chloride. The soil vapor results are included as **Table 3** and the location of SVMP-20-01 is included on **Figure 1B**. Soil vapor results are discussed further in Section 3.3. Monitoring for VOCs at the Plant 6 entrance will continue in 2024.
- *Weathered bedrock wells MW-14-61, MW-17-86, and MW-19-120* – located in the northeast lobe of the lower 1,4-dioxane plume on Plant 2, these wells were previously monitored semi-annually for VOCs and are now monitored annually (MW-17-86 is now biennially) starting in 2023 due to IGMP revisions. Previously, low detections were observed of chlorinated VOCs (e.g., 1,2-DCE; chloroethane) related to leakage from the perched zone. VOCs were not detected in MW-14-61, MW-17-86, MW-19-120 in 2023. VOCs will continue to be monitored in the weathered bedrock zone.
- *Plant 2 western property boundary* – MW-22-156, located on the western property boundary of Plant 2, was sampled for VOCs on a quarterly basis in accordance with the 2023 IGMP as part of an ongoing investigation into the 1,4-dioxane source investigation at the property boundary discussed in the *MW-14-58R Area September 2023 Investigation Summary* (Arcadis 2024). The VOC results for MW-22-156 exceed DW criteria for 1,1-dichloroethene (1,1-DCE) and include detections of 1,1-dichloroethane. Monitoring well MW-22-157, located off-site and west of this area has not had any detections of VOCs, and both wells will continue to be monitored for VOCs in 2024.

3.1.5 PFAS Results

The following sections discuss the PFAS groundwater results at the Site.

3.1.5.1 PFOS Results

Perfluorooctane sulfonic acid (PFOS) concentrations exceeded the GSI criteria (12 nanograms per liter [ng/L]) and DW Criteria (16 ng/l) at 20 perched monitoring wells in 2023 (**Figure 6**).

- *MW-18-98*: Located on the northern portion of Plant 3, this perched well contained concentrations of PFOS between 140 ng/L to 250 ng/L in 2023, exceeding the DW and GSI criteria. Further north, the perched well MW-19-113 is screened in a similar depth interval and was dry in 2023 suggesting no further migration.
- *MW-18-88, MW-18-93, MW-18-95, and eastern Plant 3 off-site wells*: Perched monitoring wells located along the eastern boundary of Plant 3 contained PFOS concentrations of 150 to 320 ng/L at MW-18-88, 38 ng/L at MW-18-93, and 29 to 55 ng/L at MW-18-95. PFOS did not exceed the DW and GSI criteria in 2023 at any of the five perched monitoring wells installed in the City of Lansing's Dunnebacke and Westside Parks, located east of Plant 3.
- *MW-12-12 and MW-13-36R*: Located along the northern and eastern boundary of Plant 6, these wells contained concentrations of PFOS that exceed the DW and GSI criteria. However, PFOS detections did not exceed DW criterion at the vertical aquifer profiling (VAP) or off-site monitoring wells completed east of Plant 6 to delineate PFAS impacts.

3.1.5.2 PFOA Results

Perfluorooctanoic acid (PFOA) concentrations exceeded the DW Criterion of 8 ng/L at 31 perched monitoring wells in 2023 (**Figure 7**).

- *MW-18-88, MW-18-93, MW-18-95, and eastern Plant 3 off-site wells*: Perched monitoring wells located along the eastern boundary of Plant 3 contained PFOA concentrations of 6.1 to 9.7 ng/L at MW-18-88 and 29 ng/L at MW-18-93. MW-18-95 previously had exceeded DW criterion in 2022 but was non-detect in 2023. Additionally, PFOA has not exceeded the DW criterion at any of the five perched sentinel monitoring wells installed in the City of Lansing's Dunnebacke and Westside Parks.
- *MW-04-05(6), MW-12-10R, MW-12-12, MW-13-36R, MW-14-67, MW-14-70, MW-20-131, MW-20-132, and MW-22-151*: Perched monitoring wells located along the northeastern and eastern boundaries of Plant 6 and off-site, contained concentrations of PFOA that exceed the DW criterion. Additional investigation work was completed in September through December 2022 east of MW-22-145 including the installation of three additional wells (MW-22-158, MW-22-159 and MW-22-160) to complete delineation of PFOA (Arcadis 2023d). MW-22-158 and MW-22-160 were sampled quarterly in 2023 and did not exceed DW Criteria. MW-22-159 has been dry since installation in 2022. Off-site PFAS concentrations will continue to be monitored to evaluate concentration trends and stability.
- *MW-12-09 and MW-14-58R*: Perched monitoring wells located near the western boundary of Plant 2 both contained PFOA at 16 ng/L, exceeding the PFOA DW Criteria. This area is currently being investigated as part of the MW-14-58R evaluation (Arcadis 2024). There is the potential that PFAS concentrations near the Plant 2 boundary and within the Rosemary right-of-way could be combined with impacts associated with other potential off-site sources.

3.1.5.3 PFNA Results

Perfluorononanoic acid (PFNA) concentrations exceeded the DW criterion value of 6 ng/L at seven perched monitoring wells in 2023 (**Figure 8**). The highest concentration of PFNA was 220 ng/L observed in Plant 6 source area well P6-SB-07. Other exceedances ranged from 7.3 ng/L to 27 ng/L. Exceedances near the eastern property boundary of Plant 6 are delineated by downgradient wells.

3.1.5.4 Other PFAS Compounds

The only detections of perfluorohexanesulfonic acid (PFHxS) that exceed the DW criterion value (51 ng/L) in 2023 were concentrations of 250 to 300 ng/L in perched well MW-21-139 in the Plant 2 PFAS source area, 1,400 ng/L in Plant 3 source area monitoring well CH-14-RO, and 100 to 190 ng/L in perched well MW-18-103 located along the northern boundary of Dunneback Park east of Plant 3. The PFHxS detected at MW-18-103 appears to be isolated and may be related to an off-site source to the north where large quantities of roofing shingles are piled on the ground surface, processed, and recycled.

Sporadic low detections of perfluorobutanesulfonic acid (PFBS) and perfluorohexanoic acid (PFHxA) observed in monitoring wells during 2023 are below the DW criteria values of 420 ng/L and 400,000 ng/L, respectively.

In addition to PFOS, PFOA, PFNA, PFHxS, PFBS, and PFHxA, other PFAS compounds have been detected at the Site, however there are no established criteria for comparison. In general, these concentrations appear to correlate to PFOS and PFOA concentrations and decrease with distance from PFOS and PFOA source areas.

3.1.5.5 Storm Sewer Analytical Results

Storm sewer PFAS analytical results from 2023 are summarized on **Tables 8** through **10** with exceedances of Rule 57 criteria highlighted in gray. Third and fourth quarter data are also summarized on **Figures 9** through **11** Results of the third and fourth quarter 2023 sampling events are summarized below.

- Flow was not observed at outfall P3-MH-NE at the northeast corner of Plant 3.
- P2-MH-2 exceeded the Rule 57 criteria for PFOS of 12.0 ng/L during third quarter 2023 and fourth quarter 2023 with detections of 17 ng/L and 18 ng/L, respectively. No other outfall exceedances occurred on Plant 2 in third and fourth quarter 2023.
- P3-MH-284 did not exceed the Rule 57 criteria for PFOS during third quarter 2023 and fourth quarter 2023. No outfall exceedances occurred on Plant 3 in the third and fourth quarter 2023.
- Rule 57 criteria for PFOS was exceeded near Plant 6 as listed below. No other exceedances occurred on Plant 6 in third and fourth quarter 2023.
    - Osborn-MH-1 exceeded in the third quarter with a detection of 14 ng/L.
    - The northern invert of Osborn-MH-1, Osborn-MH-1_N, exceeded in the fourth quarter with a detection of 18 ng/L. The norther invert is the Osborn-MH-1 discharge and used as the fourth quarter Osborn-MH-1 sample.
    - Verlinden-MH-5 exceeded in the fourth quarter with a detection of 13 ng/L.

3.2 Light Nonaqueous Phase Liquid Monitoring

LNAPL is present in the central portion of Plant 2 and in the north-central portion of Plant 3 . LNAPL monitoring well locations and approximate extent of LNAPL are presented on **Figures 1A** and **1C**. LNAPL thicknesses were generally consistent with previous observations and are provided in **Table 4**. LNAPL trend graphs are included in **Appendix D**. The trend graphs indicate that, when present, LNAPL thickness generally gradually increases until it reaches equilibrium within the well and then stabilizes. For the deeper LNAPL, wells take longer to equilibrate with the confined LNAPL conditions relative to the static water level within the formation. The comprehensive *Plant 2 LNAPL Conceptual Site Model* was provided to EGLE for review on February 20, 2020 (Arcadis 2020). Based on the monitoring results, there is no indication of LNAPL migration. The LNAPL monitoring wells that have displayed consistent thicknesses of LNAPL were abandoned as part of 2023 well abandonment scope of work approved by EGLE.

3.3 Soil Vapor Monitoring

Soil vapor sampling at SVMP-20-01 near the Plant 6 entrance does not show soil vapor results in excess of the site-specific vapor intrusion criteria (SSVIAC). The results of the soil gas samples showed trichloroethene (TCE) at a concentration of 5.7 micrograms per cubic meter (µg/m^3) in August 2023, below the EGLE SSVIAC criterion of 67 µg/m^3. The remaining three samples from 2023 were non-detect for TCE (< 1.6 µg/m^3). Tetrahydrofuran was detected at 6.3 µg/m^3 in May but was non-detect in the remaining samples collected in 2023. Vinyl chloride has not been detected in any of the four soil vapor samples. SVMP analytical results are summarized on **Table 3** and compared to the EGLE Residential SSVIAC for a house with a basement.

3.4 Groundwater Elevation Monitoring

Site-wide groundwater elevation surveys were completed during both the semi-annual and annual 2023 events. Additional groundwater elevation measurements were collected at sampled wells during the quarterly events. **Table 5** summarizes groundwater elevation measurements collected at the Site. Groundwater elevation contour maps (**Figures 12** through **15**), LNAPL trend graphs (**Appendix D**), and groundwater elevation hydrographs (**Appendix E**) are provided for review. Trends within each water-bearing zone are discussed below.

3.4.1 Perched Zone

The groundwater elevation hydrographs included in **Appendix E** indicate that potentiometric surface elevations in the perched zone have been stable to increasing during the period of monitoring beginning in 2012. Storm sewer modifications were completed at Plant 3 during November 2018 and at Plant 2 in 2019 and 2020. Comparison of potentiometric surface elevations observed on Plant 3 prior to storm sewer modifications and post-modification potentiometric surface elevations generally show increased variability of water levels with fluctuations (both increasing and decreasing) that are within the range of seasonal variation. Perched potentiometric surface elevations on Plant 2 generally show a gradual increasing trend since 2012 and an increase in the slope of the trend following the 2019 storm sewer modifications. It is unclear whether the small changes in groundwater elevation on Plant 2 are influenced by storm sewer modifications, or part of longer-term trends related to decommissioning of the plants. Groundwater elevations at Plant 6 perched monitoring wells have been generally stable since 2012.

Due to the predominance of clay-rich sediment, the perched zone is interbedded and has an overall low permeability and is characterized by isolated sand zones within layers of silt and clay. The potentiometric surface measured within the perched zone is presented on **Figure 12** (Plants 2 and 6) and **Figure 13** (Plant 3). Both figures include potentiometric surface contours for all wells less than 25 feet deep. The lower conductivity clay and silt that dominate this zone result in high horizontal and vertical gradients. Sand zones are discontinuous and often do not correlate from well to well, and minor variations in well screen elevation have a significant impact on the potentiometric surface. Therefore, although the contour maps represent the overall shallow potentiometric surface, they are of limited use to determine groundwater flow direction.

3.4.2 Deep Overburden

Saturated deep overburden is present only at Plant 3 within a southwest-northeast trending bedrock valley. Groundwater present within the deep overburden is hydraulically connected to the weathered bedrock and bedrock zones. The groundwater elevation hydrographs included in **Appendix E** show that deep overburden water levels appear to be decreasing since 2020 following a period of steady increases 2016 to 2020. The variations observed in deep overburden water levels are likely the result of changes in precipitation, as well as long-term changes in municipal pumping.

Figure 14 presents potentiometric surface elevation contours for deep overburden wells located on Plant 3. In the northern portion of Plant 3, the apparent groundwater gradient is northwesterly. In the southwestern portion of Plant 3 there is a groundwater high below the former “coliseum” (former stamping area basement) source area with an apparent gradient to the southeast.

3.4.3 Weathered Bedrock and Bedrock

Potentiometric surface trend graphs for select bedrock and weathered bedrock wells are included in **Appendix E**. Following a period of increasing elevations from 2016 to 2020, the bedrock and weathered bedrock elevations have been decreasing since 2021 with an overall increase in vertical gradient (0.34 ft/ft downward) within the Saginaw Formation. The variable potentiometric surface is likely attributed to changes in municipal pumping patterns, both long-term and seasonally.

Similar to the perched zone, the depth of a monitoring well within the weathered bedrock or bedrock zones plays a large role in the potentiometric surface observed at that location. Large vertical gradients occur in formations with vertical anisotropy and indicate a lack of vertical groundwater communication. Traditional groundwater elevation contour maps were not prepared for the weathered bedrock wells because they would be of limited use for interpreting groundwater flow direction and transport.

For the bedrock (and by extension, the weathered bedrock), the effective head or “corrected” potentiometric surface elevation can be calculated based on the observed vertical gradients. As indicated in **Table 6**, the vertical gradient tends to be limited near the coliseum and increases to the south to 0.49 ft/ft downward at wells MW-15-72/MW-12-05R (located in central Plant 2) before stabilizing to 0.61 ft/ft downward at wells MW-13-52/MW-13-50 (located on western Plant 6). This variation in vertical gradient appears to coincide with the transition between bedrock formations. Near the former coliseum in the western portion of Plant 3, where the bedrock encountered consists of the more uniform and permeable Grand River Formation, the vertical gradient is negligible. To the south, within the interbedded sandstone and shale of the Saginaw Formation, there is a significant vertical gradient due to the vertical anisotropy created by the interbedded shale and sandstone of the Saginaw Formation. Review of the bedrock wells and other deep boring logs suggests an approximate geologic contact between the

Grand River and Saginaw Formations oriented roughly southwest to northeast. **Figure 15** includes the interpreted location of the geologic contact.

To calculate the effective head for the bedrock, an average downward gradient 0.34 ft/ft was applied to bedrock monitoring wells installed within the Saginaw Formation (**Table 6**) as follows:

$$GW_{eff} = GW – (dh/dl * \Delta Elev)$$

Where:

GW_{eff} = effective groundwater elevation

GW = measured groundwater elevation

dh/dl = vertical gradient

ΔElev = change in elevation between deepest well and measured well

As shown on **Figure 15**, the corrected bedrock groundwater elevation contours are a good match for the distribution of the lower 1,4-dioxane plume located within the weathered bedrock zone. Groundwater flow is generally to the southeast, but as documented in the December 5, 2019 *Update Meeting Presentation* provided to EGLE, the gradient in the central part of Plant 2 has become flatter and more variable in recent years with a west to east flow component beneath the Plant 2 LNAPL area.

4 Groundwater Plume Stability

A preliminary groundwater plume stability assessment was completed at the Site in April 2014 (Arcadis 2014a). The primary objective of that assessment was to provide an initial evaluation of plume stability and determine the suitability of monitored plume stability as a remedial alternative. The preliminary plume stability assessment used data collected between October 2011 and first quarter 2014 as well as geochemical data collected during the August and September 2013 events.

The plume stability assessment has been updated annually and incorporated into the annual reports. Stability assessments have been generally consistent and demonstrate that historical increasing trends are primarily limited to 1,4-dioxane in weathered bedrock wells, and PFOS and 1,4-dioxane in perched wells. Operation of the biosparge system in weathered bedrock has decreased concentrations in the lower 1,4-dioxane plume significantly since 2020. The plume stability assessment presented in this section represents an updated analysis of time-series concentration trends using data collected through fourth quarter 2023.

The updated statistical analysis of dissolved-phase constituent of concern (COC) concentrations with time was completed using the Mann-Kendall slope trend test. A revised list of wells and parameters were used for this report. The updated wells and parameters includes all wells that are part of the approved 2023 IGMP and meet the following criteria:

- At least seven sampling events have been completed.
- At least 50 percent of the sampling results were greater than detection limits.
- At least 25 percent of the sampling results exceeded the lowest relevant criteria in the last six sampling events.

Guidance for conducting the Mann-Kendall test have been provided in Section 17.3.2 of the US EPA guidance document (USEPA 2009). The Mann-Kendall trend test is a non-parametric test to evaluate if a statistically

significant unidirectional (consistently increasing or decreasing) trend was observed during the monitoring period. Correlations were accepted as significant for p-values less than or equal to the alpha value, 0.10 (with a confidence level of 90 percent). Additional information regarding the Mann-Kendall analysis and methods is provided in the 2014 *Preliminary Groundwater Geochemical and Plume Stability Assessment* (Arcadis 2014a) and in **Appendix F**. **Table 7** presents a comprehensive summary Mann-Kendall trend analysis results. The overall trend results are shown on **Figures 16** and **17** for perched and weathered bedrock zones, respectively. **Appendix F** presents plots of concentrations through time for all well/COC pairs that met criteria for statistical trend analysis.

4.1 Perched Zone

4.1.1 1,4-Dioxane

The 1,4-dioxane plume appears to be stable, decreasing, or show no significant trend within the perched zone.

4.1.2 Volatile Organic Compounds

Concentrations of VOCs in the perched zone are sporadic, and a large plume footprint has not been observed; rather, VOC concentrations in groundwater greater than DW criteria are limited to discrete source areas (e.g., central portion of Plant 2) and areas immediately surrounding observed LNAPL at Plants 2 and 3. VOC data showed decreasing or no significant trends across the Site with the exception of MW-14-60 in central Plant 2, which has an increasing trend of vinyl chloride. Vinyl chloride trend results for MW-14-60 are driven by increasing concentrations through 2019 (up to 12 µg/L). Since 2019, vinyl chloride concentrations have decreased at MW-14-60 (currently 4 µg/L).

4.1.3 PFOS, PFOA, PFNA, and PFHxS

Twenty-eight monitoring wells met the criteria for Mann-Kendall analysis for PFOA, PFOS, PFNA, and/or PFHxS during 2023. Statistical trend analysis indicates that six wells (MW-12-09, MW-14-60, MW-14-67, and MW-18-88, MW-18-98, and MW-18-103) have statistically increasing trends and all other wells with PFAS concentrations exceeding criteria demonstrate stable to decreasing trends. An increasing trend was observed at MW-14-67 for PFOA near the eastern boundary of Plant 6. This monitoring well was sampled semi-annually for PFAS, and concentrations remained stable during 2023 with PFOA concentrations of 19 ng/L in February, and 20 ng/L in October. PFOA is currently defined east of Plant 6 by results from monitoring wells.

Increasing trends are also observed for PFOS at Plant 3 at monitoring well MW-18-88. An increase in PFOS at well MW-18-88 was observed in first, second, and fourth quarters of 2023, ranging from 150 – 320 ng/L between February and November. Increasing trends of PFOS are not observed at the six perched sentinel monitoring wells installed further east within the City of Lansing's Dunnebacke and Westside Parks. PFHxS at MW-18-103 is an exception, which has concentrations up to 190 ng/L, compared to a range of < 0.51 to 1.4 J ng/L observed at the other five off-site perched sentinel wells. The presence of PFHxS at MW-18-103 appears to be isolated and may be related to an off-site source area.

Monitoring well MW-18-98 has shown an increasing trend for PFNA. The trend is related to a spike in concentration (up to 13 ng/L) in 2022 and has been decreasing since 2022 (currently 4 ng/L).

4.2 Deep Overburden and Weathered Bedrock

4.2.1 1,4-Dioxane

Prior to the operation of the biosparge system, concentrations within the lower 1,4-dioxane plume had decreasing to stable trends in the northern portion of the plume on Plant 3, and stable to increasing trends towards the toe of the plume and the Plant 2 LNAPL area. Since the biosparge startup, concentrations throughout the lower 1,4-dioxane plume are mostly stable to decreasing, with the exception of MW-20-127, MW-16-85, and MW-14-56, which show increasing trends.

Monitoring well MW-20-127 is a weathered bedrock well at Plant 2 located downgradient of biosparge Transect B. MW-20-127 has exhibited an overall increasing trend for 1,4-dioxane between 2020 and 2023, ranging from approximately 85 µg/L up to 180 µg/L. Monitoring wells surrounding MW-20-127 show stable to decreasing trends. Monitoring well MW-20-107 will continue to be sampled for 1,4-dioxane on a semi-annual basis in accordance with the 2023 IGMP.

Monitoring well MW-16-85 is a weathered bedrock well at the northeast lobe of the 1,4-dioxane plume on Plant 2, which initially indicated decreasing trends after the biosparge startup. In October of 2023 concentrations increased from near 7 µg/L to 28 µg/L. Monitoring well MW-16-85 will continue to be sampled for 1,4-dioxane on a semi-annual basis in accordance with the 2023 IGMP.

MW-14-56 is a weathered bedrock well on the western border of Plant 2 that has exhibited increasing trends for 1,4-dioxane since the installation of the well in 2014. Well MW-14-56 is located outside of the RACER lower 1,4-dioxane plume and downgradient of the APC facility. Rising concentration at this well may be attributed to the APC facility.

5 Conclusions

This Annual Report summarizes the groundwater monitoring activities completed between January and December 2023, consistent with the 2019 and 2023 Revised IGMP. Based on the results of the sampling and review of the plume stability evaluation, the following conclusions are offered:

- *Lower 1,4-Dioxane:* Installation of the biosparge system for the lower 1,4-dioxane plume has been completed per the *Interim Measures Work Plan: Lower 1,4-Dioxane Biosparge* work plan (Arcadis 2018). The Plant 3 biosparge system began operating in May of 2019, and the Plant 2 biosparge system began operating in August of 2020. Since the biosparge startup, concentrations across the lower 1,4-dioxane plume are mostly stable to decreasing. Three weathered bedrock wells exhibits increasing trends for 1,4-dioxane on Plant 2 (MW-20-127, MW-16-85, and MW-14-56). Deep impacts in these areas appear to be localized. These wells will continue to be monitored according to the 2023 IGMP.
- *Perched 1,4-Dioxane:* Elevated detections of 1,4-dioxane at MW-14-58R and associated wells on western Plant 2 will continue to be monitored semi-annually. Recommendations from the *MW-14-58R Area September 2023 Investigation Summary* (Arcadis, 2024) will also be carried out to determine next steps.

- *1,4-Dioxane in Bedrock:* Sporadic detections of 1,4-dioxane in deeper bedrock monitoring wells installed along the core of the plume ranged from 0.12 µg/L to 5.7 µg/L and did not exceed drinking water criteria in 2023.
  - Lansing Township wells TWP-90-03, TWP-90-04, and TWP-90-05 were sampled in October 2023 and analyzed for 1,4-dioxane using USEPA Method 522 for drinking water. Concentrations of <0.20 (TWP-90-03), 0.24 (TWP-90-04), and 0.36 µg/L (TWP-90-05), were reported and are consistent with previous sampling results. The low-level detections of 1,4-dioxane in the region may result from several regional and/or numerous nonpoint sources. Annual sampling of Lansing Township wells will continue in 2024.
- *VOCs:* Groundwater sample results indicate that concentrations of 1,1-dichloroethene and vinyl chloride exceed residential drinking water criteria during at least one sampling event at the Site. Elevated concentrations of 1,1-dichloroethene are observed in one perched zone monitoring well, MW-22-156, on the western property boundary of Plant 2. Concentrations of elevated 1,1-dichloroethene at MW-22-156 appears to be localized, as on-site and off-site wells in the vicinity remain below detection. Low concentrations of vinyl chloride at the northeast property boundary of Plant 6 at MW-22-154 increased from non-detect to 2 µg/L in October 2023, which exceeds the SSVIAC of 0.96 µg/L. Soil vapor sampling at SVMP-20-01, located between the Plant 6 entrance and the residential properties located to the northeast, has not detected vinyl chloride. Monitoring for VOCs at the Plant 6 entrance will continue in 2024.
- *PFAS Compounds:* PFOS, PFOA, PFNA, and PFHxS concentrations exceeded DW and GSI Criteria in perched monitoring wells during 2023 groundwater monitoring events. Concentrations of PFAS in perched groundwater at Plants 2, 3, and 6 property boundaries, show stable to decreasing trends, except for one well on Plant 2 western boundary, one well on the Plant 6 eastern boundary, and two wells on or near the Plant 3 eastern boundary (one on-site and one off-site). These locations appear to be localized or are delineated off-site. Additional sampling will continue in 2024 to monitor PFAS impacts.
- *Stormwater PFAS:* The quarterly storm sewer sampling indicates the storm sewer modifications at Plant 3 have successfully reduced PFAS discharge to concentrations at or below the Rule 57 criteria. Plant 2 and 6 modifications have reduced PFAS concentrations to near Rule 57 Criteria and will continue to be monitored for changes.
- *LNAPL:* LNAPL extent and thicknesses are consistent with previous annual reports, there is no indication of LNAPL migration. LNAPL thickness monitoring will be discontinued in 2024.

Based on these conclusions, no immediate action is recommended at this time. Results of the monitoring program do not suggest changes are required for the previously submitted *Plant 2 LNAPL Conceptual Site Model* (Arcadis 2020), or the *Lower 1,4-Dioxane Conceptual Site Model* (Arcadis 2021a). Further, there are no apparent risks of exposure noted for the surrounding residential neighborhoods. Groundwater and storm sewer PFAS monitoring will continue consistent with the 2023 revised IGMP.

6 Proposed IGMP Modifications

An update to the IGMP will be provided to EGLE under separate cover. At a minimum the revised IGMP will incorporate new monitoring wells, remove LNAPL gauging, and propose wells to be abandoned. The revised plan will be provided under separate cover to EGLE during the 3rd quarter 2024.

7 References

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Tables

Table 1A
Revised Interim Groundwater Monitoring Summary - Plant 2
Revised May 2019
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
Plant 2								
Perched								
MW-01(2)	A	B					VOC monitoring	VOC Change from A to B. MTBE is detected consistently below criteria. No other VOCs detected
MW-02(2)	Abandon							consistent non-detects / do not need 4 wells in Area 1
MW-03(2)	Abandon							consistent non-detects / do not need 4 wells in Area 1
MW-12-09	A	B	A			SA	VOC monitoring, perched 1,4-dioxane monitoring, PFAS monitoring	
MW-12-18	SA	B				SA	VOC monitoring, PFAS monitoring	VOC change from SA to B /1,1-DCE at 1 to 2 ug/L is the only VOC detected / Removed Metals Analysis / Consistent Non-Detects
P2-MW-04	A		A		Qd		perched 1,4-dioxane monitoring, SVOC evaluation	
P2-SB-20	A						groundwater elevation monitoring	Removed VOC, 1,4-d Analysis / Consistently non-detect for at least the past 6 years
LMW-12-01	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
LMW-12-02	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.04 feet.
LMW-12-03D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Elliminate LNAPL Removal
LMW-12-03S	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.01 feet.
LMW-12-04	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.02 feet.
LMW-12-05	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.18 feet.
LMW-12-06	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
LMW-12-07	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.02 feet.
LMW-12-08	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
LMW-14-12D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Elliminate LNAPL Removal
LMW-14-13D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for One Year
LMW-14-14D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed Monthly for One Year
LMW-14-15D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Elliminate LNAPL Removal
LMW-15-16D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Elliminate LNAPL Removal
LMW-15-17D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed During Monthly Checks for One Year was 0.01 feet.
PMW-01	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
PMW-02	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
PMW-03	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
P2-SB-37	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
MW-12-07	A						groundwater elevation monitoring	Removed VOC Analysis / Has always been non-detect for VOCs
MW-12-08	A						groundwater elevation monitoring	Reduce LNAPL gauging to SA
MW-12-17	Abandon							Consistent non-detects / do not need 4 wells in Area 1
P2-MW-02	A						groundwater elevation monitoring	Removed VOC Analysis / Consistently non-detect for VOCs
P2-MW-03	A						groundwater elevation monitoring	
P2-SB-03	A						groundwater elevation monitoring	Removed VOC and 1,4-D Analysis / Consistently non-detect for VOCs and 1,4-D
P2-SB-06	A						groundwater elevation monitoring	Removed VOC and SVOC Analysis / Consistently non-detect for VOCs and SVOCs
MW-14-54	A	B					VOC monitoring, SVOC evaluation	VOC change from A to B / Stable Trends. Removed SVOC Analysis / Consistent Non-Detects
MW-14-55	A	B					VOC monitoring	VOC change from A to B / Intermittent VOC detections are consistently below criteria
MW-14-57	A		A				perched 1,4-dioxane monitoring	Remove VOCs/ Intermittent VOC detections are consistently below criteria
MW-14-58	SA	B	A			SA	perched 1,4-dioxane monitoring, PFAS Monitoring	VOC Analysis changed to biennial / VOCs never detected 1,4-D Change from SA to A / Stable trend
MW-14-59	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, SVOC monitoring, PFAS monitoring	VOC change from A to B / 1,1-DCE exceeds DW but has been stable for 5 years
MW-14-60	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, SVOC monitoring, PFAS monitoring	VOC change from A to B / VC exceeds DW but has been stable for 3 years
MW-14-62	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, SVOC monitoring, PFAS Monitoring	VOC change from A to B / Intermittent VOC detections are consistently below criteria
Deep Overburden and Weathered Bedrock								
MW-13-43	SA		SA				lower 1,4-dioxane monitoring	
MW-13-45	SA		SA				lower 1,4-dioxane monitoring	
MW-13-51	A		A				lower 1,4-dioxane monitoring	1,4-D change from B to A / Increased Monitoring of Plume
MW-14-56	A		A			SA	lower 1,4-dioxane monitoring / PFAS monitoring	Removed VOC Analysis / Consistent Non-Detects Removed Metals Analysis / No exceedances 1,4-D Change from SA to A / APC plume / Added PFAS
MW-14-61	SA	A	SA		Qd	SA	lower 1,4-dioxane monitoring, VOC, SVOC & PFAS monitoring	VOC change from SA to A / Single detections of 1,1,1-TCA and Chloroethane below criteria / Added SVOCs/PFAS
MW-14-63	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No detections
MW-15-72	SA	A	SA		Qd	SA	lower 1,4-dioxane monitoring/VOC, SVOC, PFAS monitoring	Added SVOC / PFAS Analysis
MW-15-73	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections Removed Metals Analysis / No metal exceedences 1,4-D Change from SA to A / APC plume
MW-16-74	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-75	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-76	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D exceedances
MW-16-77	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D exceedances
MW-16-78	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-79	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-80	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-81	SA	A	SA			SA	lower 1,4-dioxane monitoring / PFAS monitoring	VOCs change from SA to A / No VOC detections 1,4-D Change from Q to SA/ >4 samples collected
MW-16-82	SA		SA				lower 1,4-dioxane monitoring	VOCs removed / No VOC detections 1,4-D Change from Q to SA / >4 samples collected
MW-16-83	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections
MW-16-84	SA	A	SA				lower 1,4-dioxane monitoring	VOCs change from SA to A / No VOC detections 1,4-D Change from Q to SA/ >4 samples collected
MW-16-85	SA	A	SA				lower 1,4-dioxane monitoring	VOC change from SA to A / No VOC detections
MW-17-86	SA	A	SA				lower 1,4-dioxane monitoring	Well added / VOC to A
MW-19-115	SA		SA				lower 1,4-dioxane monitoring	Well added
MW-19-116	SA		SA				lower 1,4-dioxane monitoring	Well added
MW-19-117	SA		SA				lower 1,4-dioxane monitoring	Well added
PW-14-01	SA		SA				lower 1,4-dioxane monitoring	
PW-14-02	SA	B	SA				lower 1,4-dioxane monitoring	VOC change from SA to B / No VOC detections
TW-14-02	SA	B	SA				lower 1,4-dioxane monitoring	VOC change from SA to B / No VOC detections
Bedrock								
MW-12-01	A		A(1)				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections > DW
MW-12-02	A		A(1)				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-12-05R	A		A(1)				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-13-44	A		A(1)				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-12-06	A		A(1)				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections
MW-17-87	A		A(1)				bedrock 1,4-dioxane monitoring	Well added
MW-19-118S	A		A(1)				bedrock 1,4-dioxane monitoring	New nested deep bedrock well / 1,4-Dioxane only
MW-19-118D	A		A(1)				bedrock 1,4-dioxane monitoring	New nested deep bedrock well / 1,4-Dioxane only
MW-19-125	A		A(1)				bedrock 1,4-dioxane monitoring	Proposed deep bedrock well / 1,4-Dioxane only
Lansing Township Wells								
TWP-03	-		A(1)				Municipal Well 1,4-dioxane monitoring	
TWP-04	-		A(1)				Municipal Well 1,4-dioxane monitoring	
TWP-05	-		A(1)				Municipal Well 1,4-dioxane monitoring	

Notes:

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.

** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.

(1) = Analyzed for 1,4-dioxane via low-level USEPA Method 522

New wells will be added to the figures and incorporated into the annual monitoring once 4 samples are collected and a COC list is determined.

M = Monthly

Q = Quarterly

SA = Semi-annual

A = Annual

B = Biennial (starting 2nd quarter of 2020)

Qd = Quadrennial

Table 1A
Revised Interim Groundwater Monitoring Summary - Plant 3
Revised May 2019
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Well	Gauging*	Analyte						Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS		
Plant 3									
Perched									
CH-14-RO	SA			A	A		SA	metals monitoring, PFAS montiroing	Removed VOC Analysis / No VOC detections
MW-05(3)	A	A						VOC monitoring	
MW-06(3)	Abandon								Removed VOC & SVOC Analysis / ND or Decreasing Trend / Abandon - Redundant
UNK-09	Abandon								Remove Guaging/Abandon - Redundant
UNK-10	A	A						VOC monitoring	
UNK-11	A	A				Qd		VOC monitoring, SVOC monitoring	Removed Metals Analysis / Stable to Decreasing Trend / Added SVOC Analysis
MW-13-31	A							groundwater elevation monitoring	Removed Metals & SVOCs/ Stable to Decreasing Trend /attributed to offsite
MW-13-32	A			B		Qd		groundwater elevation monitoring/ SVOC & Metals monitoring	Perimeter monitoring for metals and SVOCs
MW-13-33	Abandon								Removed Metals Analysis / Stable to Decreasing Trend / Abandon
LMW-12-09	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA/ Max LNAPL Thickness Observed in 4 Quarters was 0.04 feet.
LMW-12-10	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA
LMW-12-11	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA / No LNAPL Observed for 4 Quarters
UNK-13	SA							Reduce LNAPL gauging to SA	Change LNAPL Gauging to SA
UNK-14	SA							Reduce LNAPL gauging to SA	Change LNAPL Gauging to SA
MW-04(3)	A							groundwater elevation monitoring	
MW-12-19	A							groundwater elevation monitoring	
P3-SB-07	SA							groundwater elevation monitoring	Guaging used to evaluate bulkheading and PFAS area
P3-SB-28	A					Qd		groundwater elevation monitoring, SVOC monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-14-65	A							groundwater elevation monitoring	Removed VOC and SVOC Analysis / ND
UNK-15	Q						Q	PFAS monitoring	
MW-18-88	Q	A		A	A		Q	PFAS monitoring/ monitoring VOC & Metals	Well Added
MW-18-89	Q						Q	PFAS monitoring	Well Added
MW-18-90	Q						Q	PFAS monitoring	Well Added
MW-18-91	Q						Q	PFAS monitoring	Well Added
MW-18-92	SA						SA	PFAS monitoring	Well Added
MW-18-95	Q						Q	PFAS monitoring	Well Added
MW-18-96	SA						SA	PFAS monitoring	Well Added
MW-18-98	Q						Q	PFAS monitoring	Well Added
MW-18-99	Q						Q	PFAS monitoring	Well Added
MW-18-100	SA						SA	PFAS monitoring	Well Added
MW-18-102	SA						SA	PFAS monitoring	Well Added
MW-18-103	Q						Q	PFAS monitoring	Well Added
MW-18-104	SA						SA	PFAS monitoring	Well Added
MW-18-105	Q						Q	PFAS monitoring	Well Added
MW-18-106	SA						SA	PFAS monitoring	Well Added
MW-19-107	SA						SA	PFAS monitoring	Well Added
MW-19-108	SA						SA	PFAS monitoring	Well Added
MW-19-110	SA						SA	PFAS monitoring	New perched monitoring well installed August 2019
MW-19-111	SA						SA	PFAS monitoring	New perched monitoring well installed August 2019
MW-19-112	SA						SA	PFAS monitoring	New perched monitoring well installed August 2019
MW-19-113	SA						SA	PFAS monitoring	New perched monitoring well installed August 2019
MW-19-114	SA						SA	PFAS monitoring	New perched monitoring well installed August 2019
Deep Overburden and Weathered Bedrock									
MW-12-20	A		B					lower 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-12-21	SA	B	SA					lower 1,4-dioxane monitoring, VOC monitoring	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals Analysis / Stable to Decreasing Trend
MW-13-22	A	B	A					lower 1,4-dioxane monitoring, VOC monitoring	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals Analysis / Stable to Decreasing Trend
MW-13-23	A		A					lower 1,4-dioxane monitoring	
MW-13-24	A		A					lower 1,4-dioxane monitoring	
MW-13-25	SA		SA					lower 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-13-26	A							groundwater elevation monitoring	Remove B 1,4-d / 6 yrs ND
MW-13-29	A		A					lower 1,4-dioxane monitoring	
MW-13-30	A							groundwater elevation monitoring	Remove B 1,4-d / 6 yrs ND
MW-13-34	SA	B	SA					lower 1,4-dioxane monitoring, VOC monitoring,	VOC Changed from A to B / Stable to Decreasing Trend
MW-13-40	A							groundwater elevation monitoring	Removed 1,4-dioxane, added MW-18-97
MW-13-41	A	B						VOC monitoring	Added VOC Analysis Removed Metals Analysis / Stable to Decreasing Trend
MW-13-46	SA		SA					lower 1,4-dioxane monitoring	'Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-13-48	SA	B	SA					lower 1,4-dioxane monitoring. VOC monitoring	VOC Changed from A to B / Stable to Decreasing Trend
MW-13-49	A		A					lower 1,4-dioxane	'Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-19	A	B	A					lower 1,4-dioxane monitoring	
MW-22	A							metals monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed 1,4-D Analysis / Stable to Decreasing Trend
MW-23	SA						SA	PFAS monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed 1,4-D Analysis / Stable to Decreasing Trend / Add PFAS
MW-91-2 (abandoned) / MW-91-2R	SA		A	A	A		SA	lower 1,4-dioxane, PFAS and metals monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend MW-91-2 abandoned and replaced in August 2019
MW-02-02(3)	A		A					lower 1,4-dioxane monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed Metals Analysis / Stable to Decreasing Trend
MW-02-04(3)	SA		A	A			SA	lower 1,4-dioxane, PFAS and metals monitoring	Add PFAS
MW-02-01(3)	A							groundwater elevation monitoring	
MW-02-03(3)	A							groundwater elevation monitoring	
MW-04-03(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-04-04(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-13-27	A							groundwater elevation monitoring	
MW-14-64	A		A					lower 1,4-dioxane monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-15-71	A		B					lower 1,4-dioxane monitoring	1,4-D Changed from A to B / Stable to Decreasing Trend
PW-14-03	SA		SA					lower 1,4-dioxane monitoring	Remove VOCs / Stable to Decreasing Trend
MW-18-93	SA						SA	Lower PFAS monitoring	Well Added
MW-18-94	SA		A				SA	Lower PFAS, 1,4-Dioxane monitoring	Well Added
MW-18-97	SA		A				SA	Lower PFAS monitoring	Well Added
MW-18-101	SA						SA	Lower PFAS monitoring	Well Added
MW-93-1	A							groundwater elevation monitoring	
Bedrock									
MW-91-5	SA		A(1)					bedrock monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-91-6	SA		A(1)					bedrock monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-13-28	SA		A(1)					bedrock monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-13-38	A		A(1)					bedrock monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-13-39B	A							groundwater elevation monitoring	
MW-13-47	SA		A(1)					bedrock monitoring	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from SA to A / Stable to Decreasing Trend
MW-04-01(3)	Abandon								Anomalous elevation in bedrock / no used for contouring or sampling
MW-04-02(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-12-04	A							groundwater elevation monitoring	
MW-13-37	A		A(1)					1,4-D monitoring	Added Annual 1,4-Dioxane
MW-88-1	A							groundwater elevation monitoring	
MW-91-3	A							bedrock monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-91-4	A							groundwater elevation monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-19-119S	A		A(1)					bedrock monitoring	New nested deep bedrock well / 1,4-Dioxane only
MW-19-119D	A		A(1)					bedrock monitoring	New nested deep bedrock well / 1,4-Dioxane only

Notes:

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.
** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.
(1) - Analyzed for 1,4-dioxane via low-level USEPA Method 522
Q = quarterly
SA = semi-annual
A = annual
B = biennial (starting 2nd quarter of 2020)
Qd = Quadrennial

Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
Plant 6								
Perched								
MW-02-03(6)	A	B	A		Qd		perched 1,4-dioxane monitoring, SVOC monitoring	VOC Changed from A to B / Stable to Decreasing Trend
MW-03-04	A						groundwater elevation monitoring	Removed VOC, 1,4-d Analysis / Stable to Decreasing Trend
MW-03-06	A	B	A				perched 1,4-dioxane monitoring	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals and SVOC Analysis / Stable to Decreasing Trend
MW-03-08	A	B					perched VOC monitoring	VOC Changed from A to B / removed 1,4-d /Stable to Decreasing Trend
MW-04-05(6)	A					A	perched PFAS monitoring	Removed VOC, 1,4-d and Metals Analysis / Stable to Decreasing Trend
MW-12-11	A					A	PFAS monitoring	Removed Metals Analysis / Stable to Decreasing Trend /PFAS Stability
MW-12-12	Q					Q	PFAS monitoring	Removed Metals Analysis / Stable to Decreasing Trend /PFAS Stability
MW-12-13	Q			A		Q	PFAS monitoring	Metals Changed from SA to A / Stable to Decreasing Trend / PFAS Stability
MW-12-16	A						groundwater elevation monitoring	Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite
MW-13-35	A						groundwater elevation monitoring	Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite/ Retain well for potential PFAS monitoring
MW-13-36R	Q			A		Q	Metals and PFAS monitoring	Metals Changed from SA to A / Stable to Decreasing Trend / PFAS Stability
MWBP-10-UST1-4	Abandon							Only used for groundwater elevation monitoring. High well density in Area 7
MWBP-10A-UST1-4	Abandon							Only used for groundwater elevation monitoring. High well density in Area 8
MWBP-10-UST5-6	A	B		B			VOCs/metal monitoring	VOC Changed from A to B / Stable to Decreasing Trends Metals Changed from SA to B / Stable to Decreasing Trends
MWBP-11-UST1-4	A	B		B			VOCs/metal monitoring	VOC Changed from A to B / Stable to Decreasing Trends
MWBP-12A-UST1-4	Abandon							Consistently non detect for VOCs/stable metals. High well density in area 7.
MWBP-12-UST1-4	A	B		B	Qd		VOCs/metal monitoring, SVOC monitoring	VOC Changed from A to B / Stable to Decreasing Trends
P6-SB-18	A						groundwater elevation monitoring	
P6-SB-37	A						groundwater elevation monitoring	
MW-02-02(6)	Abandon							Only used for groundwater elevation monitoring.
MW-03-02	A						groundwater elevation monitoring	Removed Metals Analysis / Stable to Decreasing Trend
MW-03-05	A	B	A				perched 1,4-dioxane monitoring, VOCs monitoring	VOC Changed from A to B / Stable to Decreasing Trend
MW-12-10R	A						groundwater elevation monitoring	
MW-12-14	A						groundwater elevation monitoring	
MW-12-15								Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite/ Retain well for potential PFAS monitoring
MWBP-12-UST5-6	Abandon							Consistently non detect for VOCs/stable metals. High well density in area 7.
MWBP-13A-UST1-4	Abandon							Consistently non detect for VOCs/stable metals. High well density in area 7.
P6-MW-01	A						groundwater elevation monitoring	
P6-SB-07	Q				Qd	Q	PFAS monitoring, SVOCs monitoring	PFAS Stability
P6-SB-21	A						groundwater elevation monitoring	
P6-SB-35	A						groundwater elevation monitoring	
SME-MW-02	Abandon							Only used for groundwater elevation monitoring.
MW-14-66	A			B			metals monitoring	Removed VOC Analysis / Stable to Decreasing Trend / Added PFAS
MW-14-67	Q			B		Q	metals monitoring, PFAS Monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-14-70	Q					Q	PFAS monitoring	PFAS Stability
MW-14-68	A						PFAS monitoring	Dry Since Installation in 2014 / Continue to check Annually
MW-14-69	A						PFAS monitoring	Dry Since Installation in 2014 / Continue to check Annually
Deep Overburden and Weathered Bedrock								
MW-13-52	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from B to A
MW-13-53	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from B to A
Bedrock								
MW-04-01(6)	A		B				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-04-04R	A		B			A	bedrock 1,4-dioxane monitoring, PFAS Monitioring	Removed VOC Analysis / Stable to Decreasing Trend
MW-04-06R	A		B			A	bedrock 1,4-dioxane monitoring, PFAS Monitioring	Removed VOC Analysis / Stable to Decreasing Trend
MW-12-03	A						groundwater elevation monitoring	
MW-13-50	A		B				bedrock 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.
** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.
Q = quarterly
SA = semi-annual
A = annual
B = biennial (starting 2nd quarter of 2020)
Qd = Quadrennial

Table 1B
Revised Interim Groundwater Monitoring Summary
Revised October 2023
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Well	Screen Interval (ft bgs)	Gauging*	Analyte				Primary Function
			VOCs	1,4-Dioxane	SVOCs	PFAS	
Plant 2							
Perched							
LMW-12-01	7-12	SA					LNAPL Monitoring
LMW-12-02	5-10	SA					LNAPL Monitoring
LMW-12-03D	17.3-22.3	SA					LNAPL Monitoring
LMW-12-03S	4-9	SA					LNAPL Monitoring
LMW-12-04	16-21	SA					LNAPL Monitoring
LMW-12-05	7-12	SA					LNAPL Monitoring
LMW-12-06	4-9	SA					LNAPL Monitoring
LMW-12-07	4-9	SA					LNAPL Monitoring
LMW-12-08	8-13	SA					LNAPL Monitoring
LMW-14-12D	18-23	SA					LNAPL Monitoring
LMW-14-13D	17.5-22.5	SA					LNAPL Monitoring
LMW-14-14D	18-23	SA					LNAPL Monitoring
LMW-14-15D	18-23	SA					LNAPL Monitoring
LMW-15-16D	19.5-24.5	SA					LNAPL Monitoring
LMW-15-17D	20-25	SA					LNAPL Monitoring
MW-01(2)	10-20	SA	B				VOC sentinel
MW-12-07	10-15	SA					Groundwater elevation monitoring
MW-12-08	19-24	SA					Groundwater elevation monitoring
MW-12-09	14-19	SA	B	B		A	VOC Sentinel, perched 1,4-dioxane sentinel, PFAS sentinel
MW-12-18	28-33	SA	B			A	VOC sentinel, PFAS sentinel
MW-14-54	14-19	SA	B				VOC monitoring
MW-14-55	13-18	SA	Qd				VOC monitoring
MW-14-57	15-20	SA		A			Perched 1,4-dioxane monitoring
MW-14-58R	22-27	SA	B	A		A	Perched 1,4-dioxane monitoring, PFAS Monitoring
MW-14-59	12-17	SA	B	A	Qd	A	Perched 1,4-dioxane monitoring, SVOC evaluation, PFAS monitoring
MW-14-60	15-20	SA	B	A	Qd	A	Perched 1,4-dioxane monitoring, SVOC evaluation, PFAS monitoring
MW-14-62	12-17	SA	B	A	Qd	A	Perched 1,4-dioxane monitoring, PFAS Monitoring
MW-21-139	7-12	SA		SA		SA	Perched 1,4-dioxane monitoring
MW-22-153	25-30	SA	Q	Q			Perched 1,4-dioxane monitoring
MW-22-155	25.5-30.5	SA		Q			Perched 1,4-dioxane monitoring
MW-22-156	23-28	SA		Q			Perched 1,4-dioxane monitoring
MW-22-157	24-29	SA		Q			Perched 1,4-dioxane monitoring
MW-23-161	20-25	SA	Q	Q			Perched 1,4-dioxane monitoring
MW-23-162	29-34	SA	Q	Q			Perched 1,4-dioxane monitoring
MW-23-163	20-25	SA	Q	Q			Perched 1,4-dioxane monitoring
P2-MW-02	31-41	SA				A	Groundwater elevation monitoring
P2-MW-03	27-32	SA					Groundwater elevation monitoring
P2-MW-04	26-36	SA		A	Qd	A	Perched 1,4-dioxane monitoring, SVOC evaluation
P2-SB-03	14-19	SA					Groundwater elevation monitoring
P2-SB-06	24-29	SA					Groundwater elevation monitoring
P2-SB-20	8-13	SA					Groundwater elevation monitoring
P2-SB-37	5-10	SA					LNAPL Monitoring
PMW-01	2.59-7.59	SA					LNAPL Monitoring
PMW-02	2.59-7.59	SA					LNAPL Monitoring
PMW-03	1.2-6.2	SA					LNAPL Monitoring
Deep Overburden and Weathered Bedrock							
MW-13-43	72-77	SA		SA			Lower 1,4-dioxane monitoring
MW-13-45	72-77	SA		SA			Lower 1,4-dioxane monitoring
MW-13-51	77-87	SA					Lower 1,4-dioxane sentinel
MW-14-56	71-76	SA		A		A	Lower 1,4-dioxane sentinel
MW-14-61	70-75	SA	A	SA	Qd	A	Lower 1,4-dioxane sentinel, SVOC Monitoring, PFAS Monitoring
MW-14-63	68-73	SA		A			Lower 1,4-dioxane sentinel
MW-15-72	63-68	SA	B	SA	Qd	A	Lower 1,4-dioxane monitoring
MW-15-73	78-83	SA		B			Lower 1,4-dioxane monitoring
MW-16-74	66-71	SA		A			Lower 1,4-dioxane sentinel
MW-16-75	66-71	SA		A			Lower 1,4-dioxane sentinel

Well	Screen Interval (ft bgs)	Gauging*	Analyte				Primary Function
			VOCs	1,4-Dioxane	SVOCs	PFAS	
Plant 2							
MW-16-76	70-75	SA		A			Lower 1,4-dioxane sentinel
MW-16-77	66-71	SA		A			Lower 1,4-dioxane sentinel
MW-16-78	68-73	SA		A			Lower 1,4-dioxane sentinel
MW-16-80	68-73	SA		A			Lower 1,4-dioxane monitoring
MW-16-81	70-75	SA	B	SA		A	Lower 1,4-dioxane monitoring
MW-16-82	70-75	SA		A			Lower 1,4-dioxane monitoring
MW-16-83	71-76	SA		B			Lower 1,4-dioxane sentinel
MW-16-84	72-77	SA	A	SA			Lower 1,4-dioxane monitoring
MW-16-85	74-79	SA	B	SA			Lower 1,4-dioxane monitoring
MW-17-86	73-78	SA	B	SA			Lower 1,4-dioxane monitoring
MW-19-115	72.5-77.5	SA		SA			Lower 1,4-dioxane monitoring
MW-19-116	65-70	SA		SA			Lower 1,4-dioxane monitoring
MW-19-117	54-59	SA		SA			Lower 1,4-dioxane monitoring
MW-19-120	66-71	SA	A	SA			Lower 1,4-dioxane monitoring
MW-19-121	66-71	SA		SA			
MW-19-122	59-64	SA		SA			
MW-19-123	66-71	SA		SA			
MW-19-124	65-70	SA		SA			
MW-20-126	69-74	SA		SA			
MW-20-127	72-77	SA		SA			
MW-20-128	65-70	SA		SA			
MW-20-129	64-69	SA		SA			
MW-20-130	63-68	SA		SA		SA	PFAS Sentinal
MW-21-140	67-72	SA		SA			Lower 1,4-dioxane monitoring
MW-21-142	71.5-76.5	SA		SA			Lower 1,4-dioxane monitoring
PW-14-01	71.6-76.8	SA		SA			Lower 1,4-dioxane monitoring
PW-14-02	75-80	SA	Qd	SA			Lower 1,4-dioxane monitoring
TW-14-02	67-72	SA	Qd	SA			Lower 1,4-dioxane monitoring
TW-15-12	73-78	SA		SA			
Bedrock							
MW-12-01	87-110	SA		B(1)			Bedrock sentinel
MW-12-02	87-110	SA		B(1)			Bedrock sentinel
MW-12-05R	100-112	SA		A(1)			Bedrock sentinel
MW-12-06	80.6-99.5	SA		A(1)			Bedrock sentinel
MW-13-44	96-115	SA		A(1)			Bedrock sentinel
MW-17-87	100-112	SA		A(1)			Bedrock sentinel
MW-19-118D	175-190	SA		A(1)			Bedrock sentinel
MW-19-118S	145-160	SA		A(1)			Bedrock sentinel
MW-19-125	100-115	SA		A(1)			Bedrock sentinel
Lansing Township Wells							
TWP-03	-	-		A(1)			Municipal Well
TWP-04	-	-		A(1)			Municipal Well
TWP-05	-	-		A(1)			Municipal Well
Storm Sewer							
P2-MH-2	-	-				Q	PFAS sewer monitoring
P2-MH-9	-	-				Q	PFAS sewer monitoring, typically dry, no sample
P2-MH-W	-	-				Q	PFAS sewer monitoring

Notes:

Wells shown in gray shading are part of biosparge performance monitoring, not part of previous formal IGMP submission. Additional details included in Table 7.

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.

** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.

(1) = Analyzed for 1,4-dioxane via low-level USEPA Method 522

New wells will be added to the figures and incorporated into the annual monitoring once 4 samples are collected and a COC list is determined.

ft bgs = feet below ground surface

M = Monthly

Q = Quarterly

SA = Semi-annual

A = Annual (2Q or 4Q of each year, each year rotates which quarter)

B = Biennial (starting 2nd quarter of 2020)

Qd = Quadrennial (every four years, starting 2020)

Well	Screen Interval (ft bgs)	Gauging*	Analyte						Primary Function
			VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS	
Plant 3									
Perched									
CH-14-RO	7-12	SA			Qd	Qd		A	Metals monitoring
LMW-12-09	3-8	SA							LNAPL Monitoring
LMW-12-10	14-19	SA							LNAPL Monitoring
LMW-12-11	15-20	SA							LNAPL Monitoring
MW-05(3)	10-15	SA	B						VOC sentinel
MW-13-31	5-10	SA							Groundwater elevation monitoring
MW-13-32	5-10	SA			Qd		Qd		Groundwater elevation monitoring / perimeter SVOC & Metals monitoring
MW-14-65	5-10	SA							Groundwater elevation monitoring
MW-18-88	6-11	SA	B		Qd	Qd		SA	PFAS monitoring / sentinel VOC & Metals
MW-18-89	7-12	SA						A	PFAS monitoring
MW-18-90	15-20	SA						A	PFAS monitoring
MW-18-91	7-12	SA						A	PFAS monitoring
MW-18-92	23-28	SA						A	PFAS sentinel
MW-18-95	4.5-9.5	SA						SA	PFAS monitoring
MW-18-96	7-12	SA						A	PFAS sentinel
MW-18-98	7-12	SA						SA	PFAS sentinel
MW-18-99	9-14	SA						SA	PFAS sentinel
MW-18-100	8-13	SA						SA	PFAS sentinel
MW-18-102	10-15	SA						A	PFAS sentinel
MW-18-103	5-10	SA						A	PFAS monitoring
MW-18-104	5-10	SA						A	PFAS sentinel
MW-18-105	6-11	SA						SA	PFAS monitoring
MW-18-106	5-10	SA							PFAS sentinel
MW-19-107	23-28	SA						SA	PFAS sentinel
MW-19-108	23-28	SA						SA	PFAS sentinel
MW-19-110	8-13	SA						A	PFAS sentinel
MW-19-111	20-25	SA						SA	PFAS sentinel
MW-19-112	9-14	SA						A	PFAS sentinel
MW-19-113	16-21	SA						A	PFAS sentinel
MW-19-114	6-11	SA						A	PFAS sentinel
P3-SB-07	11-16	SA							Groundwater elevation monitoring
P3-SB-28	8-13	SA					Qd		Groundwater elevation monitoring
UNK-10	11-16	SA							VOC sentinel
UNK-11	6.5-11.5	SA					Qd		VOC monitoring/SVOCs monitoring, VOCs sentinel well
UNK-15	11-16	SA						SA	PFAS monitoring
Deep Overburden and Weathered Bedrock									
MW-02-01(3)	59-69	SA							Groundwater elevation monitoring
MW-02-02(3)	74-84	SA		B					Lower 1,4-dioxane sentinel
MW-02-03(3)	79-89	SA							Groundwater elevation monitoring
MW-02-04(3)	76-86	SA		B	Qd			A	Lower 1,4-dioxane/PFAS/metals sentinel
MW-04-03(3)	80-90	SA							Groundwater elevation monitoring
MW-04-04(3)	72-82	SA							Groundwater elevation monitoring
MW-12-20	75-80	SA		B					Lower 1,4-dioxane sentinel
MW-12-21	70-75	SA	B	SA					Lower 1,4-dioxane monitoring
MW-13-22	89-94	SA	B	A					Lower 1,4-dioxane monitoring
MW-13-23	69-74	SA		B					Lower 1,4-dioxane sentinel
MW-13-24	69-74	SA		B					Lower 1,4-dioxane sentinel
MW-13-25	67-72	SA		A					Lower 1,4-dioxane monitoring
MW-13-26	72-77	SA							Groundwater elevation monitoring
MW-13-27	67-72	SA							Groundwater elevation monitoring
MW-13-29	68-73	SA		A					Lower 1,4-dioxane monitoring
MW-13-30	72-77	SA							Groundwater elevation monitoring
MW-13-34	74-79	SA	B	SA					Lower 1,4-dioxane monitoring
MW-13-40	72-77	SA							Groundwater elevation monitoring
MW-13-41	77-82	SA	B						lower VOC sentinel
MW-13-46	68-73	SA		A					Lower 1,4-dioxane monitoring

Table 1B
Revised Interim Groundwater Monitoring Summary
Revised October 2023
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

ARCADIS

Well	Screen Interval (ft bgs)	Gauging*	Analyte						Primary Function
			VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS	
Plant 3									
MW-13-48	65-70	SA	B	SA					Lower 1,4-dioxane monitoring
MW-13-49	73-78	SA		B					Lower 1,4-dioxane monitoring
MW-14-64	98.6-103.6	SA		B					Lower 1,4-dioxane sentinel
MW-15-71	110-115	SA		B					Lower 1,4-dioxane sentinel
MW-18-93	77.5-82.5	SA						A	Lower PFAS Sentinel
MW-18-94	72-77	SA						A	Lower PFAS, 1,4-Dioxane Sentinel
MW-18-97	85-90	SA						A	Lower PFAS Sentinel
MW-18-101	80-85	SA		B				SA	Lower PFAS Sentinel
MW-19	55-65	SA		B					Lower 1,4-dioxane sentinel
MW-22	52.5-62.5	SA							Groundwater elevation monitoring
MW-23	52-62	SA						A	PFAS sentinel
MW-91-2R	75-80	SA		B	Qd	Qd		A	Lower 1,4-dioxane, PFAS and metals sentinel
MW-93-1	65-75	SA							Groundwater elevation monitoring
PW-14-03	85-90	SA		SA					Lower 1,4-dioxane monitoring
TW-14-06	82-87	SA		SA					
TW-15-11	85-90	SA		SA					
Bedrock									
MW-04-01(3)	95-105	-							No longer part of sampling or gauging
MW-04-02(3)	126-136	SA							Groundwater elevation monitoring
MW-12-04	77-100	SA							Groundwater elevation monitoring
MW-13-28	99-115.5	SA		A(1)					Bedrock sentinel
MW-13-37	97-112	SA		B(1)					1,4-D sentinel
MW-13-38	107-124	SA		B(1)					Bedrock sentinel
MW-13-39B	97-112	SA							Groundwater elevation monitoring
MW-13-47	99-119	SA		B(1)					Bedrock sentinel
MW-19-119D	180-195	SA		A(1)					Bedrock sentinel
MW-19-119S	145-160	SA		A(1)					Bedrock sentinel
MW-88-1	103.5-140	SA							Groundwater elevation monitoring
MW-91-3	105-117	SA							Bedrock sentinel
MW-91-4	116-132.5	SA							Groundwater elevation monitoring
MW-91-5	112.5-128	SA		B(1)					Bedrock sentinel
MW-91-6	82-98	SA		B(1)					Bedrock sentinel
Storm Sewer									
P3-MH-284	-	-						Q	PFAS sewer monitoring
P3-MH-NE	-	-						Q	PFAS sewer monitoring, typically dry, no sample

Notes:

Wells shown in gray shading are part of biosparge performance monitoring, not part of previous formal IGMP submission. Additional details included in Table 7.

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.

** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.

(1) - Analyzed for 1,4-dioxane via low-level USEPA Method 522

ft bgs = feet below ground surface

Q = quarterly

SA = semi-annual

A = annual

B = biennial (starting 2nd quarter of 2020)

Qd = Quadrennial (every four years, starting 2020)

Table 1B
Revised Interim Groundwater Monitoring Summary
Revised October 2023
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Well	Screen Interval (ft bgs)	Gauging*	Analyte					Primary Function
			VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS	
Plant 6								
Perched								
MW-02-02(6)	35-45	SA	B	A		Qd		Perched 1,4-dioxane monitoring, SVOC evaluation
MW-03-02	30-40	SA						Groundwater elevation monitoring
MW-03-04	33-43	SA						Groundwater elevation monitoring
MW-03-05	35-45	SA	B	A				Perched 1,4-dioxane sentinel
MW-03-06	30-40	SA	B	A				Perched 1,4-dioxane sentinel
MW-03-08	35-45	SA						Perched VOC monitoring
MW-04-05(6)	20-30	SA	SA				A	Perched PFAS sentinel
MW-12-10R	10-15	SA					A	Groundwater elevation monitoring, PFAS
MW-12-11	13-18	SA					A	PFAS Sentinel
MW-12-12	13-18	SA					SA	PFAS monitoring
MW-12-13	18.5-23.5	SA			Qd		SA	PFAS monitoring
MW-12-14	25-30	SA						Groundwater elevation monitoring
MW-12-15	18-23	-						Potential PFAS Monitoring if needed/ No gauging necessary
MW-12-16	28-33	SA						Boundary monitoring
MW-13-35	25-30	-						Potential PFAS Monitoring if needed/ No gauging necessary
MW-13-36R	5.5-10.5	SA			Qd		SA	PFAS monitoring
MW-14-66	14-19	SA			Qd			Metals sentinel
MW-14-67	13-18	SA			Qd		A	Metals/PFAS sentinel
MW-14-69	41-46	SA						Groundwater elevation monitoring
MW-14-70	16-21	SA					A	PFAS Sentinel
MW-20-131	5-10	SA	SA				SA	PFAS monitoring
MW-20-132	6-11	SA	SA				SA	PFAS monitoring
MW-21-133	10-15	SA					SA	PFAS monitoring
MW-21-134	11-16	SA					SA	PFAS monitoring
MW-21-135	22-27	SA					SA	PFAS monitoring
MW-21-136	9-14	SA					A	PFAS monitoring
MW-21-137	7-12	SA					A	PFAS monitoring
MW-21-138	24-29	SA					A	PFAS monitoring
MW-22-143	26-31	SA					Q	PFAS monitoring
MW-22-144	19.5-24.5	SA					Q	PFAS monitoring
MW-22-145	10.5-15.5	SA					Q	PFAS monitoring
MW-22-146	5.5-10.5	SA					Q	PFAS monitoring
MW-22-147	7.5-12.5	SA					Q	PFAS monitoring
MW-22-148	24.5-29.5	SA					Q	PFAS monitoring
MW-22-149	5.5-10.5	SA					Q	PFAS monitoring
MW-22-150	13-18	SA					Q	PFAS monitoring
MW-22-151	13-18	SA					Q	PFAS monitoring
MW-22-152	10-15	SA	SA				Q	PFAS monitoring
MW-22-154	16-11	SA	Q					VOCs monitoring
MW-22-158	16-21	SA					Q	PFAS monitoring
MW-22-159	26-31	SA					Q	PFAS monitoring
MW-22-160	14-19	SA					Q	PFAS monitoring
MWBP-10-UST5-6	28-38	SA			Qd			VOCs/metal monitoring
MWBP-11-UST1-4	9-19	SA			Qd			VOCs/metal monitoring
MWBP-12-UST1-4	15-25	SA	B		Qd	Qd		VOCs/metal monitoring, SVOC evaluation
P6-MW-01	23-28	SA						Groundwater elevation monitoring
P6-SB-07	15-20	SA				Qd	A	PFAS monitoring
P6-SB-18	3-8	SA						Groundwater elevation monitoring
P6-SB-21	3-8	SA						Groundwater elevation monitoring
P6-SB-35	3-8	SA						Groundwater elevation monitoring
P6-SB-37	5-10	SA						Groundwater elevation monitoring

Well	Screen Interval (ft bgs)	Gauging*	Analyte					Primary Function
			VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS	
Plant 6								
Deep Overburden and Weathered Bedrock								
MW-13-52	70-80	SA		B				Lower 1,4-dioxane sentinel
MW-13-53	73-83	SA						Lower 1,4-dioxane sentinel
MW-21-141	72-77	SA		SA				Lower 1,4-dioxane sentinel
Bedrock								
MW-04-01(6)	78-88	SA		B				Bedrock sentinel
MW-04-04R	82-110	SA		B			A	Bedrock sentinel
MW-04-06R	74-99.5	SA		B			A	Bedrock sentinel
MW-12-03	57-80	SA						Groundwater elevation monitoring
MW-13-50	85-107	SA		B				Bedrock sentinel
Storm Sewer								
Osborn-MH-1	-	-					Q	PFAS sewer monitoring
Verlinden-MH-1	-	-						PFAS sewer monitoring
Verlinden-MH-2	-	-						PFAS sewer monitoring
Verlinden-MH-3	-	-						PFAS sewer monitoring
Verlinden-MH-4	-	-						PFAS sewer monitoring
Verlinden-MH-5	-	-					Q	PFAS sewer monitoring
MichAve-MH-3	-	-					Q	PFAS sewer monitoring
MichAve-MH-4	-	-						PFAS sewer monitoring

Notes:

* Site wide gauging to alternate between semi-annual events to account for seasonal variability. Semi-annual gauging includes all wells sampled semi-annually.

** Select metals includes arsenic, nickel, lead, vanadium, chromium, and copper.

***TAL metals defined in Table 3 of the Quality Assurance Project Plan (ARCADIS 2011b).

ft bgs = feet below ground surface

Q = quarterly

SA = semi-annual

A = annual

B = biennial (starting 2nd quarter of 2020)

Qd = Quadrennial (every four years, starting 2020)

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	CH-14-RO	MW-02-02(6)	MW-02-04(3)	MW-03-05	MW-03-06	MW-04-04R	MW-04-05(6)	MW-04-05(6)	MW-04-06R	MW-12-05R*	MW-12-06*	MW-12-09
Date Collected:				11/4/2023	10/30/2023	11/2/2023	10/30/2023	10/30/2023	10/30/2023	05/23/23	10/31/2023	10/31/2023	10/25/2023	10/25/2023	10/26/2023
Sample Name:				CH-14-RO_110423	MW-02-02(6)_103023	MW-02-04(3)_110223	MW-03-05_103023	MW-03-06_103023	MW-04-04R_103023	MW-04-05(6)_052323	MW-04-05(6)_103123	MW-04-06R_103123	MW-12-05R_102523	MW-12-06_102523	MW-12-09_102623
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.22	6.82	6.87	7.81	6.73	6.96	7.43	7.46	7.43	9.97	7.40	7.22
Conductivity	- -	- -	mS/cm	0.989	4.203	3.406	1.373	6.880	0.892	2.210	2.058	4.216	0.429	0.723	1.925
Turbidity	- -	- -	NTU	2.44	5.67	193.00	21.00	15.00	23.00	1.30	8.52	49.00	35.00	28.00	131.58
Dissolved oxygen (DO)	- -	- -	mg/L	0.26	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.97	8.95	0.14
Temperature	- -	- -	Deg C	16.0	9.4	12.8	10.3	10.6	7.9	13.6	13.3	9.3	16.7	15.5	17.2
Oxidation reduction potential (ORP)	- -	- -	millivolts	122.1	-18.8	11.7	-96.6	-32.3	-70.2	-115.3	-87.8	-181.1	125.4	17.8	-96.6
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	**23**	NA	< 1 [< 1]	**5**	NA	NA	NA	NA [NA]	**0.21***	**0.12 J***	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA [NA]	NA	NA	<25	< 25	NA [NA]	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<50	< 50	NA [NA]	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<50	< 50	NA [NA]	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA [NA]	NA	NA	<50	< 50	NA [NA]	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA [NA]	NA	NA	<2	< 2	NA [NA]	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<10	< 10	NA [NA]	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA [NA]	NA	NA	<5	< 5	NA [NA]	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA [NA]	NA	NA	<90	< 90	NA [NA]	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<2	< 2	NA [NA]	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	<1	< 1	NA [NA]	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA [NA]	NA	NA	<2	< 2	NA [NA]	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	CH-14-RO	MW-02-02(6)	MW-02-04(3)	MW-03-05	MW-03-06	MW-04-04R	MW-04-05(6)	MW-04-05(6)	MW-04-06R	MW-12-05R*	MW-12-06*	MW-12-09
Date Collected:				11/4/2023	10/30/2023	11/2/2023	10/30/2023	10/30/2023	10/30/2023	05/23/23	10/31/2023	10/31/2023	10/25/2023	10/25/2023	10/26/2023
Sample Name:				CH-14-RO_110423	MW-02-02(6)_103023	MW-02-04(3)_110223	MW-03-05_103023	MW-03-06_103023	MW-04-04R_103023	MW-04-05(6)_052323	MW-04-05(6)_103123	MW-04-06R_103123	MW-12-05R_102523	MW-12-06_102523	MW-12-09_102623
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
4:2 FTS	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
6:2 FTS	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
8:2 FTS	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
ADONA	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 350 UJ	NA	< 7.4	NA [NA]	NA	< 7.0	NA	< 6.8	< 6.7 [< 80]	NA	NA	< 7.0
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**95 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	**1.6 J**	< 3.4 [< 40]	NA	NA	**2.1 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	< 170 UJ	NA	**9.4**	NA [NA]	NA	**0.85 J**	NA	**16**	**4.1 [< 40]**	NA	NA	**15**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 UJ [< 40]	NA	NA	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**330 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	**27**	< 3.4 [< 40]	NA	NA	**11**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**1400 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	**3.2 J**	< 3.4 [< 40]	NA	NA	**3.8**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**40 J**	NA	**5.3**	NA [NA]	NA	< 3.5	NA	**32**	< 3.4 [< 40]	NA	NA	**14**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	**0.82 J**	< 3.4 [< 40]	NA	NA	**0.75 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**9800 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	**3.3 J**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**100 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	**36**	< 3.4 [< 40]	NA	NA	**16**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	**310 J**	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 170 UJ	NA	**8.9**	NA [NA]	NA	**0.57 J**	NA	**27**	**1.4 J [< 40]**	NA	NA	**13**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	R [< 40]	NA	NA	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 UJ [< 40]	NA	NA	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 170 UJ	NA	< 3.7	NA [NA]	NA	< 3.5	NA	< 3.4	< 3.4 [< 40]	NA	NA	< 3.5

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-10R	MW-12-11	MW-12-12	MW-12-12	MW-12-12	MW-12-13	MW-12-13	MW-12-13	MW-12-18	MW-12-21	MW-12-21	MW-12-21
Date Collected:				10/30/2023	10/31/2023	2/15/2023	5/24/2023	11/01/23	2/15/2023	5/24/2023	10/31/2023	10/26/2023	2/17/2023	5/19/2023	8/30/2023
Sample Name:				MW-12-10R_103023	MW-12-11_103123	MW-12-12_021523	MW-12-12_052423	MW-12-12_110123	MW-12-13_021523	MW-12-13_052423	MW-12-13_103123	MW-12-18_102623	MW-12-21_021723	MW-12-21_051923	MW-12-21_083023
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.86	6.70	7.69	7.49	7.39	7.49	7.49	7.55	7.09	6.90	6.85	6.76
Conductivity	- -	- -	mS/cm	4.365	3.745	0.740	0.820	0.925	0.730	0.580	0.665	2.832	1.100	1.850	1.470
Turbidity	- -	- -	NTU	2.74	15.00	9.21	3.00	6.52	4.20	1.80	3.91	35.59	55.00	8.79	4.02
Dissolved oxygen (DO)	- -	- -	mg/L	0.19	0.00	0.49	0.15	1.08	4.59	0.70	0.29	0.27	1.60	0.77	7.22
Temperature	- -	- -	Deg C	11.1	13.2	10.1	11.5	14.3	8.4	11.5	10.0	13.4	5.6	18.1	14.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	30.2	-42.5	40.6	23.8	166.8	61.5	5.6	-99.4	-66.0	-2.8	-48.7	-13.5
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,1-Dichloroethene	7.0	130	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,1,1-Trichloroethane	200	89	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2-Dichlorobenzene	600	13	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2-Dichloroethane	5.0	360	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2-Dichloropropane	5.0	230	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,4-Dichlorobenzene	75	17	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
1,4-Dioxane	7.2	280	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	**141**	**167 [162]**	**199**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
2-Hexanone	1,000	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
2-Methylnaphthalene	260	19	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Acetone	730	1,700	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Acrylonitrile	2.6	2.0	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Benzene	5.0	200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Bromobenzene	18	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Bromodichloromethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Bromoform	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Carbon disulfide	800	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Carbon tetrachloride	5.0	38	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Chlorobenzene	100	25	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Chlorobromomethane	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Chloroethane	430	1,100	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Dibromochloromethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Dibromomethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Ethyl ether	10	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Ethylbenzene	74	18	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Hexachloroethane	7.3	6.7	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Iodomethane	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Isopropyl benzene	800	28	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Methylene chloride	5.0	1,500	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Naphthalene	520	11	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
N-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
N-Propylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Styrene	100	80	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
tert-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Tetrachloroethene	5.0	60	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Tetrahydrofuran	95	11,000	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Toluene	790	270	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Trichloroethene	5.0	200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Vinyl chloride	2.0	13	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
m&p-Xylene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
o-Xylene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA
Xylenes (total)	280	49	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-10R 10/30/2023 MW-12-10R_103023	MW-12-11 10/31/2023 MW-12-11_103123	MW-12-12 2/15/2023 MW-12-12_021523	MW-12-12 5/24/2023 MW-12-12_052423	MW-12-12 11/01/23 MW-12-12_110123	MW-12-13 2/15/2023 MW-12-13_021523	MW-12-13 5/24/2023 MW-12-13_052423	MW-12-13 10/31/2023 MW-12-13_103123	MW-12-18 10/26/2023 MW-12-18_102623	MW-12-21 2/17/2023 MW-12-21_021723	MW-12-21 5/19/2023 MW-12-21_051923	MW-12-21 8/30/2023 MW-12-21_083023
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
4:2 FTS	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 UQ [< 6.7]	< 7.5 UQ	< 6.9	< 6.9 UQ	< 7.3 UQ	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
6:2 FTS	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 UQ [< 6.7]	< 7.5 UQ	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
8:2 FTS	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5 UQ	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
ADONA	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 7.0 [< 6.9]	< 6.9	< 6.7 [< 6.7]	< 7.5	< 6.9	< 6.9	< 7.3	< 6.9	< 7.1 [< 7.5]	NA	NA [NA]	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	< 3.5 [< 3.5]	< 3.4	**< 3.3 [0.85 J]**	**1.4 J**	**1.9 J**	**1.7 J**	**3.0 J**	< 3.5	**0.77 J [1.1 J]**	NA	NA [NA]	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**9.9 [9.6]**	**5.7**	**38 [35]**	**43**	**47**	**28**	**30**	**27**	**8.4 [8.3]**	NA	NA [NA]	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	**11 [10]**	**8.5**	**12**	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	**0.43 J [< 3.4]**	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**4.6 [5.1]**	< 3.4	**32 [31]**	**34**	**47**	**22**	**21**	**28**	**3.4 J [3.2 J]**	NA	NA [NA]	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**3.3 J [< 3.5]**	< 3.4	**1.8 J [1.2 J]**	**1.3 J**	**2.2 J**	< 3.5	< 3.7	< 3.5	**0.86 J [1.0 J]**	NA	NA [NA]	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	< 3.5 [< 3.5]	**0.84 J**	**97 [88]**	**110**	**140**	**69**	**59**	**59**	**5.3 [5.3]**	NA	NA [NA]	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	**0.71 J [0.88 J]**	< 3.4	**5.9 [5.4]**	**3.6 J**	**7.3**	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**11 [10]**	< 3.4	**36 [33]**	**22**	**36**	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**8.6 [8.3]**	< 3.4	**78 [69]**	**74**	**110**	**4.9**	**5.0**	**14**	**2.2 J [2.3 J]**	NA	NA [NA]	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**6.1 [< 3.5]**	**2.1 J**	**65 [55]**	**62**	**73**	**41**	**36**	**37**	**5.3 [5.3]**	NA	NA [NA]	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4 UJ	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.5 [< 3.5]	< 3.4	< 3.3 [< 3.4]	< 3.7	< 3.5	< 3.5	< 3.7	< 3.5	< 3.5 [< 3.7]	NA	NA [NA]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-21 11/1/2023 MW-12-21_110123	MW-13-22 2/17/2023 MW-13-22_021723	MW-13-22 5/19/2023 MW-13-22_051923	MW-13-22 8/30/2023 MW-13-22_083023	MW-13-22 11/1/2023 MW-13-22_110123	MW-13-23 11/1/2023 MW-13-23_110123	MW-13-25 11/2/2023 MW-13-25_110223	MW-13-26 5/20/2023 MW-13-26_052023	MW-13-27 5/20/2023 MW-13-27_052023	MW-13-27 11/1/2023 MW-13-27_110123	MW-13-28* 11/1/2023 MW-13-28_110123	MW-13-29 5/23/2023 MW-13-29_052323
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.65	6.87	6.81	6.73	6.64	6.83	6.57	7.00	6.82	6.70	8.48	6.44
Conductivity	- -	- -	mS/cm	1.719	2.030	2.010	1.740	1.807	1.199	1.133	1.110	1.960	1.588	0.296	3.000
Turbidity	- -	- -	NTU	59.89	9.05	8.57	NA	9.49	150.00	8.70	9.92	9.41	11.40	10.43	118.00
Dissolved oxygen (DO)	- -	- -	mg/L	0.45	0.98	1.39	2.61	0.23	8.19	5.44	0.36	0.79	0.00	0.07	3.51
Temperature	- -	- -	Deg C	10.1	3.4	17.6	14.4	12.0	11.4	11.3	12.3	12.1	10.9	11.5	18.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	-64.6	-21.9	-5.1	-39.5	67.7	244.0	109.1	-10.1	-27.2	-55.9	-266.0	124.5
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**118**	**171**	**179**	**138**	**135**	< 1	< 1	< 1	**10**	**6**	**0.83***	**9**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-21	MW-13-22	MW-13-22	MW-13-22	MW-13-22	MW-13-23	MW-13-25	MW-13-26	MW-13-27	MW-13-27	MW-13-28*	MW-13-29
Date Collected:				11/1/2023	2/17/2023	5/19/2023	8/30/2023	11/1/2023	11/1/2023	11/2/2023	5/20/2023	5/20/2023	11/1/2023	11/1/2023	5/23/2023
Sample Name:				MW-12-21_110123	MW-13-22_021723	MW-13-22_051923	MW-13-22_083023	MW-13-22_110123	MW-13-23_110123	MW-13-25_110223	MW-13-26_052023	MW-13-27_052023	MW-13-27_110123	MW-13-28_110123	MW-13-29_052323
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-29	MW-13-30	MW-13-34	MW-13-34	MW-13-34	MW-13-34	MW-13-36R	MW-13-36R	MW-13-36R	MW-13-43	MW-13-43	MW-13-44*
Date Collected:				10/26/2023	5/20/2023	2/17/2023	5/19/2023	8/30/2023	11/2/2023	2/14/2023	5/24/2023	10/31/2023	5/16/2023	10/28/2023	10/25/2023
Sample Name:				MW-13-29_102623	MW-13-30_052023	MW-13-34_021723	MW-13-34_051923	MW-13-34_083024	MW-13-34_110223	MW-13-36R_021423	MW-13-36R_052423	MW-13-36R_103123	MW-13-43_051623	MW-13-43_102823	MW-13-44_102523
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.12	6.79	7.03	7.05	6.93	6.82	11.98	12.06	12.22	7.24	6.74	10.28
Conductivity	- -	- -	mS/cm	3.330	1.250	1.620	2.330	1.960	2.998	1.914	1.370	1.993	2.740	2.706	1.296
Turbidity	- -	- -	NTU	9.04	16.90	119.00	14.80	301.00	21.10	2.59	2.78	5.72	297.00	395.70	39.08
Dissolved oxygen (DO)	- -	- -	mg/L	2.34	0.90	0.16	0.99	0.26	0.21	0.56	0.14	0.34	10.51	10.20	0.27
Temperature	- -	- -	Deg C	15.2	11.7	8.0	15.0	14.3	11.7	7.3	12.3	12.8	17.0	12.1	15.6
Oxidation reduction potential (ORP)	- -	- -	millivolts	150.2	-35.1	-26.7	-80.0	-59.7	-86.4	-389.6	-42.7	-88.8	128.2	196.4	26.7
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,1-Dichloroethene	7.0	130	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,1,1-Trichloroethane	200	89	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,1,2-Trichloroethane	5.0	330	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2-Dichlorobenzene	600	13	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2-Dichloroethane	5.0	360	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2-Dichloropropane	5.0	230	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2,3-Trichloropropane	42	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2,4-Trichlorobenzene	70	99	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,2,4-Trimethylbenzene	63	17	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,3-Dichlorobenzene	6.6	28	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,3,5-Trimethylbenzene	72	45	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,4-Dichlorobenzene	75	17	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
1,4-Dioxane	7.2	280	µg/L	**7 [7]**	< 1	**85 [87]**	**109**	**106**	**82**	NA	NA	NA	**2**	< 1	**5.7* [5.0]***
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
2-Hexanone	1,000	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
2-Methylnaphthalene	260	19	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Acetone	730	1,700	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Acrylonitrile	2.6	2.0	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Benzene	5.0	200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Bromobenzene	18	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Bromodichloromethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Bromoform	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Carbon disulfide	800	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Carbon tetrachloride	5.0	38	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Chlorobenzene	100	25	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Chlorobromomethane	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Chloroethane	430	1,100	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Chloroform (Trichloromethane)	80	350	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Chloromethane (Methyl chloride)	260	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
cis-1,2-Dichloroethene	70	620	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
cis-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Dibromochloromethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Dibromomethane	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Ethyl ether	10	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Ethylbenzene	74	18	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Hexachloroethane	7.3	6.7	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Iodomethane	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Isopropyl benzene	800	28	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Methylene chloride	5.0	1,500	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Naphthalene	520	11	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
N-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
N-Propylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Styrene	100	80	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
tert-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Tetrachloroethene	5.0	60	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Tetrahydrofuran	95	11,000	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Toluene	790	270	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
trans-1,2-Dichloroethene	100	1,500	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
trans-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Trichloroethene	5.0	200	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Vinyl chloride	2.0	13	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
m&p-Xylene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
o-Xylene	- -	- -	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Xylenes (total)	280	49	µg/L	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-29 10/26/2023 MW-13-29_102623	MW-13-30 5/20/2023 MW-13-30_052023	MW-13-34 2/17/2023 MW-13-34_021723	MW-13-34 5/19/2023 MW-13-34_051923	MW-13-34 8/30/2023 MW-13-34_083024	MW-13-34 11/2/2023 MW-13-34_110223	MW-13-36R 2/14/2023 MW-13-36R_021423	MW-13-36R 5/24/2023 MW-13-36R_052423	MW-13-36R 10/31/2023 MW-13-36R_103123	MW-13-43 5/16/2023 MW-13-43_051623	MW-13-43 10/28/2023 MW-13-43_102823	MW-13-44* 10/25/2023 MW-13-44_102523
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7	< 7.4	< 7.1	NA	NA	NA [NA]
4:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7 UQ	< 7.4 UQ	< 7.1	NA	NA	NA [NA]
6:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7 UQ	< 7.4 UQ	< 7.1	NA	NA	NA [NA]
8:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7 UQ	< 7.4 UQ	< 7.1	NA	NA	NA [NA]
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7	< 7.4	< 7.1	NA	NA	NA [NA]
ADONA	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7	< 7.4	< 7.1	NA	NA	NA [NA]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 6.7	< 7.4	< 7.1	NA	NA	NA [NA]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**6.3 J**	**5.4 J**	**6.4 J**	NA	NA	NA [NA]
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**4.3 J**	**3.4 J**	**3.8 J**	NA	NA	NA [NA]
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**2.2 J**	**2.3 J**	**2.9 J**	NA	NA	NA [NA]
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**22**	**34 Q**	R	NA	NA	NA [NA]
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	< 3.5	NA	NA	NA [NA]
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**25**	**20**	**26**	NA	NA	NA [NA]
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**0.49 J**	**0.52 J**	**0.51 J**	NA	NA	NA [NA]
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	**0.86 J**	NA	NA	NA [NA]
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**32**	**32**	**38**	NA	NA	NA [NA]
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**1.4 J**	**1.9 J**	**2.3 J**	NA	NA	NA [NA]
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**35**	**33**	**43**	NA	NA	NA [NA]
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	< 3.5	NA	NA	NA [NA]
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**15**	**12**	**14**	NA	NA	NA [NA]
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**3.7**	**3.0 J**	**3.5**	NA	NA	NA [NA]
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**44**	**37**	**47**	NA	NA	NA [NA]
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**71**	**63**	**73**	NA	NA	NA [NA]
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	< 3.5	NA	NA	NA [NA]
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**30**	**31 Q**	**35 J**	NA	NA	NA [NA]
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	< 3.5	NA	NA	NA [NA]
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	< 3.3	< 3.7	< 3.5	NA	NA	NA [NA]
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA [NA]	NA	NA [NA]	NA	NA	NA	**0.80 J**	**0.72 J**	**0.79 J**	NA	NA	NA [NA]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-45	MW-13-45	MW-13-46	MW-13-48	MW-13-48	MW-14-56	MW-14-57	MW-14-58R	MW-14-58R	MW-14-58R	MW-14-58R	MW-14-59
Date Collected:				5/16/2023	10/28/2023	11/2/2023	5/19/2023	11/2/2023	10/27/2023	10/26/2023	2/15/2023	5/16/2023	8/29/2023	10/24/2023	10/25/2023
Sample Name:				MW-13-45_051623	MW-13-45_102823	MW-13-46_110223	MW-13-48_051923	MW-13-48_110223	MW-14-56_102723	MW-14-57_102623	MW-14-58R_021523	MW-14-58R_051623	MW-14-58R_082923	MW-14-58R_102423	MW-14-59_102523
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.54	6.47	6.66	6.78	6.56	6.50	7.53	7.01	6.98	6.92	6.92	7.34
Conductivity	- -	- -	mS/cm	1.430	1.478	1.841	2.600	2.922	4.011	1.152	2.847	3.090	2.760	2.545	0.694
Turbidity	- -	- -	NTU	4.29	9.17	24.00	9.49	31.43	9.94	38.89	4.93	1.27	8.71	9.94	2.12
Dissolved oxygen (DO)	- -	- -	mg/L	5.61	0.19	0.00	0.63	0.39	1.72	2.90	0.07	0.16	0.14	0.00	0.20
Temperature	- -	- -	Deg C	15.0	13.4	13.2	15.7	10.8	15.8	18.0	12.9	14.2	17.9	16.8	16.5
Oxidation reduction potential (ORP)	- -	- -	millivolts	-41.1	-51.7	-51.7	202.6	-73.6	-3.2	2.9	-175.1	92.5	-57.0	-75.7	-41.1
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
1,4-Dioxane	7.2	280	µg/L	**28**	**25**	< 1 [< 1]	**62**	**61**	**17 [14]**	< 2 UB	**178 [181]**	**173**	**250 Y**	**194**	**7**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 25 [< 25]	< 25	< 25	< 25	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 50 [< 50]	< 50	< 50	< 50	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 50 [< 50]	< 50	< 50	< 50	NA
Acetone	730	1,700	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 50 [< 50]	< 50	< 50	< 50	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 2 [< 2]	< 2	< 2	< 2	NA
Benzene	5.0	200	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Bromoform	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 10 [< 10]	< 10	< 10	< 10	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
Naphthalene	520	11	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 5 [< 5]	< 5	< 5	< 5	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Styrene	100	80	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 90 [< 90]	< 90	< 90	< 90	NA
Toluene	790	270	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 2 [< 2]	< 2	< 2	< 2	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 1 [< 1]	< 1	< 1	< 1	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA [NA]	NA	NA	NA [NA]	NA	< 2 [< 2]	< 2	< 2	< 2	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-45	MW-13-45	MW-13-46	MW-13-48	MW-13-48	MW-14-56	MW-14-57	MW-14-58R	MW-14-58R	MW-14-58R	MW-14-58R	MW-14-59
Date Collected:				5/16/2023	10/28/2023	11/2/2023	5/19/2023	11/2/2023	10/27/2023	10/26/2023	2/15/2023	5/16/2023	8/29/2023	10/24/2023	10/25/2023
Sample Name:				MW-13-45_051623	MW-13-45_102823	MW-13-46_110223	MW-13-48_051923	MW-13-48_110223	MW-14-56_102723	MW-14-57_102623	MW-14-58R_021523	MW-14-58R_051623	MW-14-58R_082923	MW-14-58R_102423	MW-14-59_102523
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
4:2 FTS	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
6:2 FTS	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
8:2 FTS	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
ADONA	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 6.9 [< 6.9]	NA	NA [NA]	NA	NA	< 6.5	< 6.9
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	**1.9 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	**7.3 [7.9]**	NA	NA [NA]	NA	NA	**11**	**15**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	**7.3**	**8.8**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	**2.7 J**	**3.1 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA [NA]	NA	NA	**1.8 J [2.2 J]**	NA	NA [NA]	NA	NA	**8.4**	**18**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA [NA]	NA	NA	**1.7 J** [< 3.5]	NA	NA [NA]	NA	NA	**4.2**	**2.8 J**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA [NA]	NA	NA	**0.91 J** [< 3.5]	NA	NA [NA]	NA	NA	**16**	**15**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	**8.3 [9.3]**	NA	NA [NA]	NA	NA	**7.3**	**13**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.6]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA [NA]	NA	NA	< 3.4 [< 3.5]	NA	NA [NA]	NA	NA	< 3.3	< 3.5

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-60	MW-14-61	MW-14-61	MW-14-62	MW-14-63	MW-14-66	MW-14-67	MW-14-67	MW-14-70	MW-14-70	MW-15-72	MW-15-72
Date Collected:				10/26/2023	5/17/2023	10/26/2023	10/26/2023	10/27/2023	10/31/2023	2/14/2023	10/31/2023	2/15/2023	10/31/2023	5/17/2023	10/27/2023
Sample Name:				MW-14-60_102623	MW-14-61_051723	MW-14-61_102623	MW-14-62_102623	MW-14-63_102723	MW-14-66_103123	MW-14-67_021423	MW-14-67_103123	MW-14-70_021523	MW-14-70_103123	MW-15-72_051723	MW-15-72_102723
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.52	7.03	7.22	11.59	6.78	7.64	7.22	7.37	7.34	7.30	6.86	6.70
Conductivity	- -	- -	mS/cm	1.392	2.700	2.171	0.693	1.220	0.846	1.368	1.300	1.510	1.408	1.130	1.289
Turbidity	- -	- -	NTU	2.08	21.10	31.00	1.70	76.11	3.02	1.23	4.91	7.48	8.57	3.41	6.23
Dissolved oxygen (DO)	- -	- -	mg/L	0.19	2.11	8.66	0.16	0.32	1.00	0.71	0.21	0.52	0.29	3.31	0.28
Temperature	- -	- -	Deg C	16.4	14.0	15.5	17.8	15.1	11.6	10.1	13.2	9.5	10.4	14.1	17.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	-125.2	239.1	289.0	-268.9	-67.6	-61.5	-222.6	60.1	62.0	75.3	-83.7	-95.4
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**6**	**13**	**13**	**70**	< 4 UB	NA	NA	NA	NA	NA	**199**	**67**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	< 25	< 25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	< 50	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	< 50	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	< 50	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	< 2	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	< 90	< 90	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	< 2	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	< 2	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-60	MW-14-61	MW-14-61	MW-14-62	MW-14-63	MW-14-66	MW-14-67	MW-14-67	MW-14-70	MW-14-70	MW-15-72	MW-15-72
Date Collected:				10/26/2023	5/17/2023	10/26/2023	10/26/2023	10/27/2023	10/31/2023	2/14/2023	10/31/2023	2/15/2023	10/31/2023	5/17/2023	10/27/2023
Sample Name:				MW-14-60_102623	MW-14-61_051723	MW-14-61_102623	MW-14-62_102623	MW-14-63_102723	MW-14-66_103123	MW-14-67_021423	MW-14-67_103123	MW-14-70_021523	MW-14-70_103123	MW-15-72_051723	MW-15-72_102723
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.8	NA	< 6.8	< 6.8	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
4:2 FTS	- -	- -	ng/L	< 6.8	NA	< 6.8	< 6.8	NA	< 6.9	< 6.8 UQ	< 6.9	< 6.8	< 6.9	NA	< 6.8
6:2 FTS	- -	- -	ng/L	< 6.8	NA	< 6.8	**17 J**	NA	< 6.9	**8.3**	< 6.9	< 6.8	< 6.9	NA	< 6.8
8:2 FTS	- -	- -	ng/L	< 6.8	NA	< 6.8	**4.2 J**	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.8	NA	< 6.8	< 6.8	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
ADONA	- -	- -	ng/L	< 6.8	NA	< 6.8	< 6.8	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.8	NA	< 6.8	< 6.8	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.8	NA	< 6.8	**1.6 J**	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.8	NA	< 6.8	**0.94 J**	NA	< 6.9	< 6.8	< 6.9	< 6.8	< 6.9	NA	< 6.8
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**2.3 J**	NA	< 3.4	**1.8 J**	NA	**2.0 J**	**3.5**	< 3.4	**3.7**	**4.6**	NA	< 3.4
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**27**	NA	**0.95 J**	R	NA	**34**	**49 Q**	**43 J**	**100**	**81**	NA	**6.5**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**1.8 J**	NA	< 3.4	**2.4 J**	NA	**7.2**	**1.3 J**	**1.2 J**	< 3.4	< 3.4	NA	< 3.4
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**16**	NA	< 3.4	**25**	NA	**16**	**30**	**37**	**110**	**110**	NA	< 3.4
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**7.9**	NA	< 3.4	**7.5**	NA	**3.4 J**	< 3.4	< 3.4	< 3.4	**1.7 J**	NA	< 3.4
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**24**	NA	< 3.4	**25**	NA	**32**	**79**	**79**	**310**	**280**	NA	**2.1 J**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	**5.1**	NA	< 3.4	**7.7**	NA	**8.5**	**0.62 J**	**0.54 J**	< 3.4	< 3.4	NA	< 3.4
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.4	NA	< 3.4	**4.0**	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**44**	NA	< 3.4	**54**	NA	**200**	**1.8 J**	**1.7 J**	< 3.4	< 3.4	NA	< 3.4
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**41**	NA	< 3.4	**59**	NA	**50**	**19**	**20**	**17**	**17**	NA	< 3.4
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.4	NA	< 3.4	**1.1 J**	NA	< 3.5	< 3.4	< 3.4	**0.59 J**	< 3.4	NA	< 3.4
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**18**	NA	**0.68 J**	**20 J**	NA	**24**	**58**	**60**	**380**	**270**	NA	**4.1**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.4	NA	< 3.4	< 3.4	NA	< 3.5	< 3.4	< 3.4	< 3.4	< 3.4	NA	< 3.4

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-74	MW-16-74	MW-16-75	MW-16-75	MW-16-76	MW-16-77	MW-16-77	MW-16-78	MW-16-78	MW-16-78	MW-16-78	MW-16-80
Date Collected:				5/17/2023	10/27/2023	5/16/2023	10/28/2023	10/26/2023	5/17/2023	10/28/2023	2/16/2023	5/17/2023	8/29/2023	10/28/2023	10/28/2023
Sample Name:				MW-16-74_051723	MW-16-74_102723	MW-16-75_051623	MW-16-75_102823	MW-16-76_102623	MW-16-77_051723	MW-16-77_102823	MW-16-78_021623	MW-16-78_051723	MW-16-78_082923	MW-16-78_102823	MW-16-80_102823
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.71	6.90	6.80	6.82	7.51	6.86	6.68	7.04	6.91	7.03	6.87	6.59
Conductivity	- -	- -	mS/cm	1.850	2.308	2.040	1.958	2.591	3.170	2.992	1.491	1.180	1.410	1.512	3.622
Turbidity	- -	- -	NTU	213.00	341.19	57.80	219.35	122.05	139.00	42.43	2.12	2.34	9.06	102.83	84.48
Dissolved oxygen (DO)	- -	- -	mg/L	0.27	0.61	0.26	0.35	7.57	1.47	1.09	1.22	0.15	0.42	0.68	0.54
Temperature	- -	- -	Deg C	14.3	15.5	20.6	13.1	13.5	11.9	12.4	12.2	12.9	16.3	12.8	12.2
Oxidation reduction potential (ORP)	- -	- -	millivolts	12.4	-31.2	-37.2	-79.1	-43.1	34.6	-37.2	-124.0	-85.9	95.0	-62.4	-36.6
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**2**	< 3 UB	**1**	< 2 UB	**6**	**2**	< 1 UB	**1 [1]**	**1**	< 1	< 1 UB	**22**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	< 25 [< 25]	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 10 [< 10]	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	< 90 [< 90]	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-74	MW-16-74	MW-16-75	MW-16-75	MW-16-76	MW-16-77	MW-16-77	MW-16-78	MW-16-78	MW-16-78	MW-16-78	MW-16-80
Date Collected:				5/17/2023	10/27/2023	5/16/2023	10/28/2023	10/26/2023	5/17/2023	10/28/2023	2/16/2023	5/17/2023	8/29/2023	10/28/2023	10/28/2023
Sample Name:				MW-16-74_051723	MW-16-74_102723	MW-16-75_051623	MW-16-75_102823	MW-16-76_102623	MW-16-77_051723	MW-16-77_102823	MW-16-78_021623	MW-16-78_051723	MW-16-78_082923	MW-16-78_102823	MW-16-80_102823
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 7.2 [< 7.2]	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	**3.2 J [2.8 J]**	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	**1.9 J [1.7 J]**	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	< 3.6 [< 3.6]	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-81	MW-16-81	MW-16-82	MW-16-82	MW-16-84	MW-16-84	MW-16-85	MW-16-85	MW-17-86	MW-17-86	MW-17-87*	MW-18-88
Date Collected:				5/17/2023	10/27/2023	5/17/2023	10/27/2023	5/17/2023	10/28/2023	5/18/2023	10/28/2023	5/17/2023	10/27/2023	10/25/2023	2/16/2023
Sample Name:				MW-16-81_051723	MW-16-81_102723	MW-16-82_051723	MW-16-82_102723	MW-16-84_051723	MW-16-84_102823	MW-16-85_051823	MW-16-85_102823	MW-17-86_051723	MW-17-86_102723	MW-17-87_102523	MW-18-88_021623
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.62	6.48	6.95	7.06	6.95	7.05	7.17	7.65	6.95	6.92	9.51	7.07
Conductivity	- -	- -	mS/cm	2.690	3.356	1.030	1.017	1.820	2.342	0.790	0.788	1.990	1.958	1.719	0.667
Turbidity	- -	- -	NTU	17.30	8.79	2.81	4.83	46.50	97.71	214.00	195.34	1.93	2.48	29.00	1.44
Dissolved oxygen (DO)	- -	- -	mg/L	0.79	1.83	0.21	3.65	0.23	4.44	0.58	4.99	0.86	0.00	0.04	0.12
Temperature	- -	- -	Deg C	16.2	19.5	14.8	17.2	16.0	14.0	18.0	13.9	16.7	15.9	16.8	6.3
Oxidation reduction potential (ORP)	- -	- -	millivolts	55.3	174.4	-72.9	25.7	-32.3	94.0	2.8	-55.4	-35.1	-59.0	-126.1	-104.8
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**168**	**99**	**1**	< 3 UB	**44**	**39**	**6**	**28**	**20**	**16**	**2.2***	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	< 25	NA	NA	NA	< 25	< 25	NA	NA	< 25	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	< 50	NA	NA	NA	< 50	< 50	NA	NA	< 50	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	< 50	NA	NA	NA	< 50	< 50	NA	NA	< 50	NA	NA	NA
Acetone	730	1,700	µg/L	< 50	NA	NA	NA	< 50	< 50	NA	NA	< 50	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	< 2	NA	NA	NA	< 2	< 2	NA	NA	< 2	NA	NA	NA
Benzene	5.0	200	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Bromobenzene	18	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Bromoform	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Carbon disulfide	800	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Chlorobenzene	100	25	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Chloroethane	430	1,100	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Dibromomethane	80	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Ethyl ether	10	- -	µg/L	< 10	NA	NA	NA	< 10	< 10	NA	NA	< 10	NA	NA	NA
Ethylbenzene	74	18	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Iodomethane	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Isopropyl benzene	800	28	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
Naphthalene	520	11	µg/L	< 5	NA	NA	NA	< 5	< 5	NA	NA	< 5	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Styrene	100	80	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	< 90	NA	NA	NA	< 90	< 90	NA	NA	< 90	NA	NA	NA
Toluene	790	270	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Trichloroethene	5.0	200	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	< 2	NA	NA	NA	< 2	< 2	NA	NA	< 2	NA	NA	NA
o-Xylene	- -	- -	µg/L	< 1	NA	NA	NA	< 1	< 1	NA	NA	< 1	NA	NA	NA
Xylenes (total)	280	49	µg/L	< 2	NA	NA	NA	< 2	< 2	NA	NA	< 2	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-81	MW-16-81	MW-16-82	MW-16-82	MW-16-84	MW-16-84	MW-16-85	MW-16-85	MW-17-86	MW-17-86	MW-17-87*	MW-18-88
Date Collected:				5/17/2023	10/27/2023	5/17/2023	10/27/2023	5/17/2023	10/28/2023	5/18/2023	10/28/2023	5/17/2023	10/27/2023	10/25/2023	2/16/2023
Sample Name:				MW-16-81_051723	MW-16-81_102723	MW-16-82_051723	MW-16-82_102723	MW-16-84_051723	MW-16-84_102823	MW-16-85_051823	MW-16-85_102823	MW-17-86_051723	MW-17-86_102723	MW-17-87_102523	MW-18-88_021623
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
4:2 FTS	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1 UQ
6:2 FTS	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
8:2 FTS	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
ADONA	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	< 7.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.0 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	**5.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**8.8**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.0 J**
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	**1.6 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.54 J**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.4 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	**2.8 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.72 J**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**150**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	**0.79 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**6.1**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.60 J**
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	**4.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.60 J**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.6

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-88	MW-18-88	MW-18-89	MW-18-89	MW-18-90	MW-18-90	MW-18-91	MW-18-91	MW-18-92	MW-18-93	MW-18-94	MW-18-95
Date Collected:				5/24/2023	11/3/2023	2/17/2023	11/4/2023	2/16/2023	11/3/2023	2/17/2023	11/4/2023	11/4/2023	11/2/2023	11/3/2023	2/17/2023
Sample Name:				MW-18-88_052423	MW-18-88_110323	MW-18-89_021723	MW-18-89_110423	MW-18-90_021623	MW-18-90_110323	MW-18-91_021723	MW-18-91_110423	MW-18-92_110423	MW-18-93_110223	MW-18-94_110323	MW-18-95_021723
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.14	7.28	7.43	7.58	12.21	12.13	7.55	7.92	6.56	7.73	7.07	7.37
Conductivity	- -	- -	mS/cm	0.530	0.711	0.814	0.856	2.158	2.107	0.707	0.658	1.184	0.489	3.892	0.514
Turbidity	- -	- -	NTU	1.23	7.79	1.33	6.45	1.81	10.83	1.23	14.45	8.05	13.00	3.78	1.50
Dissolved oxygen (DO)	- -	- -	mg/L	0.29	0.24	3.18	0.36	0.48	0.19	0.47	0.40	0.35	9.75	2.42	7.10
Temperature	- -	- -	Deg C	13.6	16.2	6.6	14.9	9.9	16.1	6.4	13.7	13.4	13.0	11.3	5.3
Oxidation reduction potential (ORP)	- -	- -	millivolts	71.2	28.1	-183.3	99.7	-284.0	-174.3	-180.6	-126.7	98.6	48.2	-93.5	13.9
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA [NA]	NA [NA]	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-88 5/24/2023 MW-18-88_052423	MW-18-88 11/3/2023 MW-18-88_110323	MW-18-89 2/17/2023 MW-18-89_021723	MW-18-89 11/4/2023 MW-18-89_110423	MW-18-90 2/16/2023 MW-18-90_021623	MW-18-90 11/3/2023 MW-18-90_110323	MW-18-91 2/17/2023 MW-18-91_021723	MW-18-91 11/4/2023 MW-18-91_110423	MW-18-92 11/4/2023 MW-18-92_110423	MW-18-93 11/2/2023 MW-18-93_110223	MW-18-94 11/3/2023 MW-18-94_110323	MW-18-95 2/17/2023 MW-18-95_021723
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
4:2 FTS	- -	- -	ng/L	< 7.3 UQ	< 7.0	< 6.8 UQ	< 6.7 [< 7.0]	< 7.0 Q [< 6.8 Q]	< 7.2	< 7.6 UQ	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9 UQ
6:2 FTS	- -	- -	ng/L	< 7.3	< 7.0	< 6.8 UQ	< 6.7 [< 7.0]	< 7.0 Q [< 6.8 Q]	< 7.2	< 7.6 UQ	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9 UQ
8:2 FTS	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 Q [< 6.8 Q]	< 7.2	< 7.6 UQ	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9 UQ
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
ADONA	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 7.3	< 7.0	< 6.8	< 6.7 [< 7.0]	< 7.0 [< 6.8]	< 7.2	< 7.6	< 6.9	< 6.8	< 6.7	< 6.9	< 6.9
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**2.3 J**	**2.3 J**	**1.1 J**	< 3.3 **[1.3 J]**	**1.5 J [1.7 J]**	< 3.6	< 3.8	< 3.5	**0.73 J**	**18**	< 3.4	**2.3 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**10**	**9.5**	**8.9**	**8.9 [7.9]**	**9.8 [9.1]**	**38 J**	**8.9**	**6.8**	**1.2 J**	**25**	**4.6**	**5.5**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	**0.89 J [0.76 J]**	< 3.6	**1.1 J**	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.6	< 3.5	**0.94 J**	< 3.3 [< 3.5]	**1.6 J [1.8 J]**	< 3.6	**0.79 J**	< 3.5	< 3.4	**3.9**	< 3.4	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	< 3.5 [< 3.4]	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**2.1 J**	**3.0 J**	**2.0 J**	< 3.3 **[2.3 J]**	**18 [17]**	**22**	< 3.8	< 3.5	< 3.4	**0.61 J**	< 3.4	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**0.65 J**	< 3.5	**3.7**	**4.4 [4.2]**	**3.7 [4.1]**	**4.8**	**2.3 J**	< 3.5	< 3.4	**21**	< 3.4	**0.62 J**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**4.1**	**6.0**	**4.2**	**5.8 [4.9]**	**17 [19]**	**20**	**1.4 J**	< 3.5	< 3.4	**18**	< 3.4	< 3.5
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**0.70 J**	< 3.5	**6.1**	**7.5 [6.3]**	**6.6 [6.5]**	**7.5**	**3.1 J**	**2.9 J**	< 3.4	**54**	< 3.4	< 3.5
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	< 3.5 [< 3.4]	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	**0.53 J**	< 3.5	**1.2 J**	**1.3 J** [< 3.5]	**1.6 J [1.5 J]**	< 3.6	**1.1 J**	< 3.5	< 3.4	**4.7**	< 3.4	**0.68 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	**0.86 J [0.71 J]**	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**200**	**320**	**120**	**170 [150]**	**880 [830]**	**1200 J**	**44**	**52**	< 3.4	**38**	< 3.4	**29**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**6.8**	**9.7**	**11**	**14 [12]**	**16 [15]**	**17**	**7.2**	**6.4**	< 3.4	**29**	< 3.4	**2.9 J**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	**0.59 J**	< 3.5	**0.68 J**	< 3.3 **[0.95 J]**	**2.6 J [2.2 J]**	**1.8 J**	< 3.8	< 3.5	< 3.4	**0.92 J**	< 3.4	< 3.5
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	**6.7 [5.4]**	< 3.5 [< 3.4]	< 3.6	< 3.8	**2.5 J**	< 3.4	**70**	**0.65 J**	< 3.5
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	< 3.5 [< 3.4]	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	< 3.5 [< 3.4]	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.6	< 3.5	< 3.4	< 3.3 [< 3.5]	< 3.5 [< 3.4]	< 3.6	< 3.8	< 3.5	< 3.4	< 3.4	< 3.4	< 3.5

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-95	MW-18-95	MW-18-97	MW-18-98	MW-18-98	MW-18-98	MW-18-99	MW-18-99	MW-18-99	MW-18-100	MW-18-100	MW-18-101
Date Collected:				5/24/2023	11/3/2023	11/3/2023	2/16/2023	5/23/2023	11/2/2023	2/16/2023	5/23/2023	11/3/2023	5/23/2023	11/3/2023	5/23/2023
Sample Name:				MW-18-95_052423	MW-18-95_110323	MW-18-97_110323	MW-18-98_021623	MW-18-98_052323	MW-18-98_110223	MW-18-99_021623	MW-18-99_052323	MW-18-99_110323	MW-18-100_052323	MW-18-100_110323	MW-18-101_052323
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.52	7.41	6.89	7.56	7.63	7.31	7.88	8.44	8.18	7.54	7.74	6.95
Conductivity	- -	- -	mS/cm	0.408	0.593	1.502	1.630	0.950	0.681	1.610	0.890	1.201	1.070	0.914	1.750
Turbidity	- -	- -	NTU	4.03	41.91	4.88	1.11	1.05	8.50	1.17	2.95	7.51	0.43	8.41	41.00
Dissolved oxygen (DO)	- -	- -	mg/L	1.54	1.25	0.00	0.81	1.42	0.56	2.07	0.33	0.31	3.62	6.19	0.15
Temperature	- -	- -	Deg C	13.7	13.5	14.0	5.9	14.7	14.1	6.7	14.7	14.1	12.4	16.5	15.1
Oxidation reduction potential (ORP)	- -	- -	millivolts	73.2	97.7	-81.4	-116.0	51.5	24.1	-172.4	-132.0	-135.5	128.3	90.6	-245.1
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-95	MW-18-95	MW-18-97	MW-18-98	MW-18-98	MW-18-98	MW-18-99	MW-18-99	MW-18-99	MW-18-100	MW-18-100	MW-18-101
Date Collected:				5/24/2023	11/3/2023	11/3/2023	2/16/2023	5/23/2023	11/2/2023	2/16/2023	5/23/2023	11/3/2023	5/23/2023	11/3/2023	5/23/2023
Sample Name:				MW-18-95_052423	MW-18-95_110323	MW-18-97_110323	MW-18-98_021623	MW-18-98_052323	MW-18-98_110223	MW-18-99_021623	MW-18-99_052323	MW-18-99_110323	MW-18-100_052323	MW-18-100_110323	MW-18-101_052323
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
4:2 FTS	- -	- -	ng/L	< 7.4 UQ	< 6.9	< 6.8	< 7.4	< 7.3 UQ [< 7.3 UQ]	< 6.8	< 7.0 UQ	< 7.3 UQ	< 6.8	< 7.3	< 6.8	< 7.3
6:2 FTS	- -	- -	ng/L	< 7.4 UQ	< 6.9	< 6.8	< 7.4	< 7.3 UQ [< 7.3 UQ]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
8:2 FTS	- -	- -	ng/L	< 7.4 UQ	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
ADONA	- -	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 7.4	< 6.9	< 6.8	< 7.4	< 7.3 [< 7.3]	< 6.8	< 7.0	< 7.3	< 6.8	< 7.3	< 6.8	< 7.3
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**1.3 J**	**2.4 J**	< 3.4	**1.7 J**	**0.50 J [0.51 J]**	**1.8 J**	**1.3 J**	**0.54 J**	< 3.4	**1.2 J**	**1.9 J**	< 3.6
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**3.6 J**	**12**	**1.5 J**	**8.1**	**4.5 [4.6]**	**20**	**9.7**	**11**	**12**	**11**	**11**	**4.0**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	**0.85 J**	**0.90 J**	**0.99 J**	< 3.6	< 3.4	< 3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6 UQ
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**0.50 J**	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	**0.84 J**	**0.67 J**	**0.72 J**	**1.2 J**	< 3.6	< 3.4	< 3.6
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**0.51 J**	< 3.5	< 3.4	**0.76 J**	**1.2 J [1.2 J]**	**3.3 J**	**2.3 J**	**1.8 J**	**3.1 J**	**1.8 J**	**2.8 J**	< 3.6
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**0.76 J**	**1.1 J**	< 3.4	< 3.7	**0.51 J [0.54 J]**	**0.79 J**	**1.4 J**	**1.4 J**	**2.2 J**	**2.0 J**	**3.7**	< 3.6
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	< 3.7	< 3.5	< 3.4	**1.3 J**	**1.8 J [1.5 J]**	**5.7**	**3.9**	**3.5 J**	**4.7**	**4.6**	**6.0**	< 3.6
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	**0.80 J**	**1.5 J**	< 3.4	**1.8 J**	**3.4 J [3.3 J]**	**3.3 J**	**1.3 J**	**1.1 J**	**1.4 J**	< 3.6	< 3.4	< 3.6
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**35**	**55**	< 3.4	**140**	**250 [250]**	**180**	**56**	**57**	**69**	< 3.6	**4.9**	< 3.6
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**3.1 J**	**6.4**	< 3.4	**1.7 J**	**3.1 J [2.9 J]**	**5.1**	**4.8**	**3.9**	**5.0**	**2.4 J**	**8.3**	< 3.6
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	**0.61 J**	< 3.6
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 3.7	**0.62 J**	**0.60 J**	< 3.7	**0.75 J [0.74 J]**	**4.3**	< 3.5	**1.8 J**	**3.5**	**3.0 J**	**3.8**	**0.64 J**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6 UQ
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6 UQ
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.7	< 3.5	< 3.4	< 3.7	< 3.6 [< 3.6]	< 3.4	< 3.5	< 3.6	< 3.4	< 3.6	< 3.4	< 3.6

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-101 11/3/2023 MW-18-101_110323	MW-18-102 11/2/2023 MW-18-102_110223	MW-18-103 2/17/2023 MW-18-103_021723	MW-18-103 11/2/2023 MW-18-103_110223	MW-18-104 11/2/2023 MW-18-104_110223	MW-18-105 2/17/2023 MW-18-105_021723	MW-18-105 5/24/2023 MW-18-105_052423	MW-18-105 11/2/2023 MW-18-105_110223	MW-19-107 5/24/2023 MW-19-107_052423	MW-19-107 11/4/2023 MW-19-107_110423	MW-19-108 5/24/2023 MW-19-108_052423	MW-19-108 11/4/2023 MW-19-108_110423	MW-19-111 5/24/2023 MW-19-111_052423	MW-19-111 11/4/2023 MW-19-111_110423
Field Parameters																	
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.05	7.28	6.90	7.04	7.30	7.11	7.31	7.21	6.84	6.55	6.75	6.89	6.78	6.53
Conductivity	- -	- -	mS/cm	1.202	0.633	0.894	0.873	0.572	0.522	0.412	0.614	0.770	0.927	1.200	1.091	1.220	1.453
Turbidity	- -	- -	NTU	4.80	31.21	1.11	5.88	5.60	1.29	3.87	6.23	140.00	20.82	33.80	9.32	2.02	9.41
Dissolved oxygen (DO)	- -	- -	mg/L	0.00	0.61	0.39	0.33	7.36	5.48	0.32	2.70	0.37	0.27	0.88	0.21	1.66	0.80
Temperature	- -	- -	Deg C	12.8	12.8	6.6	13.1	14.0	5.2	9.9	12.7	11.7	13.4	11.1	13.3	11.8	12.8
Oxidation reduction potential (ORP)	- -	- -	millivolts	-170.9	161.9	-155.2	144.4	188.4	-130.0	56.0	188.6	-10.4	24.9	20.7	58.2	62.4	158.9
Volatile Organics (via EPA Method SW5030C/8260C)																	
1,1-Dichloroethane	880	740	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-101 11/3/2023 MW-18-101_110323	MW-18-102 11/2/2023 MW-18-102_110223	MW-18-103 2/17/2023 MW-18-103_021723	MW-18-103 11/2/2023 MW-18-103_110223	MW-18-104 11/2/2023 MW-18-104_110223	MW-18-105 2/17/2023 MW-18-105_021723	MW-18-105 5/24/2023 MW-18-105_052423	MW-18-105 11/2/2023 MW-18-105_110223	MW-19-107 5/24/2023 MW-19-107_052423	MW-19-107 11/4/2023 MW-19-107_110423	MW-19-108 5/24/2023 MW-19-108_052423	MW-19-108 11/4/2023 MW-19-108_110423	MW-19-111 5/24/2023 MW-19-111_052423	MW-19-111 11/4/2023 MW-19-111_110423
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
4:2 FTS	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5 UQ	< 7.0	< 7.7 UQ	< 6.8	< 7.5 UQ	< 6.9
6:2 FTS	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
8:2 FTS	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
ADONA	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	**0.45 J**	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.7 [< 6.9]	< 6.9	< 6.7	< 7.0	< 7.0	< 7.1	< 7.4	< 7.0	< 7.5	< 7.0	< 7.7	< 6.8	< 7.5	< 6.9
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	< 3.3 [< 3.5]	< 3.5	**15**	**11**	**0.44 J**	**1.4 J**	**3.1 J**	**3.5**	**1.9 J**	**2.3 J**	**1.5 J**	**1.8 J**	**1.3 J**	**1.5 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**4.2 [3.6]**	< 3.5	**15**	**9.8**	< 3.5	< 3.6	**1.1 J**	**0.72 J**	**2.3 J**	**2.8 J**	**1.9 J**	**1.3 J**	**3.0 J**	**2.7 J**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	**0.53 J**	**0.95 J**	< 3.5	< 3.6	< 3.7	< 3.5	**0.50 J**	< 3.5	**0.64 J**	< 3.4	**0.83 J**	< 3.5
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	< 3.3 [< 3.5]	< 3.5	**100**	**190**	< 3.5	**0.51 J**	**1.1 J**	**1.3 J**	**4.4**	**6.6**	**0.89 J**	**1.4 J**	**1.3 J**	**1.3 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	< 3.3 [< 3.5]	< 3.5	**4.8**	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	**0.67 J**	< 3.5	**0.86 J**	< 3.4	**1.9 J**	< 3.5
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 3.3 [< 3.5]	< 3.5	**4.5**	**8.8**	**4.1**	**6.2**	**4.9**	**7.6**	**2.0 J**	**2.4 J**	**5.5**	**1.9 J**	< 3.7	< 3.5
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	< 3.3 [< 3.5]	< 3.5	**1.6 J**	**2.1 J**	< 3.5	< 3.6	< 3.7	< 3.5	**2.6 J**	**2.7 J**	**4.1**	< 3.4	**5.0**	**6.2**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	**14**	**13**	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	**4.5**	**2.6 J**	< 3.5	< 3.6	< 3.7	< 3.5	**0.52 J**	**1.6 J**	< 3.9	< 3.4	**1.3 J**	< 3.5
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.3 [< 3.5]	< 3.5	< 3.4	< 3.5	< 3.5	< 3.6	< 3.7	< 3.5	< 3.8	< 3.5	< 3.9	< 3.4	< 3.7	< 3.5

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-112 11/3/2023 MW-19-112_110323	MW-19-114 11/2/2023 MW-19-114_110223	MW-19-115 5/17/2023 MW-19-115_051723	MW-19-115 10/27/2023 MW-19-115_102723	MW-19-116 5/17/2023 MW-19-116_051723	MW-19-116 10/27/2023 MW-19-116_102723	MW-19-117 5/18/2023 MW-19-117_051823	MW-19-117 10/27/2023 MW-19-117_102723	MW-19-118S* 10/25/2023 MW-19-118S_102523	MW-19-118D* 10/25/2023 MW-19-118D_102523	MW-19-119S* 11/1/2023 MW-19-119S_110123
Field Parameters														
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.44	7.41	7.06	7.43	6.93	6.75	6.94	6.91	6.71	7.23	7.06
Conductivity	- -	- -	mS/cm	8.058	0.481	2.460	2.422	1.150	1.181	1.150	0.984	3.076	1.741	1.273
Turbidity	- -	- -	NTU	64.58	3.29	88.40	9.54	3.69	10.00	60.60	693.00	5.71	5.43	9.36
Dissolved oxygen (DO)	- -	- -	mg/L	0.19	0.37	5.57	5.08	1.91	5.64	0.36	0.94	0.77	8.12	1.89
Temperature	- -	- -	Deg C	17.2	14.1	14.1	21.9	14.5	19.8	17.0	19.5	18.1	16.8	7.7
Oxidation reduction potential (ORP)	- -	- -	millivolts	-73.5	98.0	19.4	212.0	-50.7	252.1	-79.4	-65.7	-92.8	163.1	-25.9
Volatile Organics (via EPA Method SW5030C/8260C)														
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	**8**	**6**	**81**	**61**	< 1	< 1	**2.6***	< 0.20*	**0.40***
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-112 11/3/2023 MW-19-112_110323	MW-19-114 11/2/2023 MW-19-114_110223	MW-19-115 5/17/2023 MW-19-115_051723	MW-19-115 10/27/2023 MW-19-115_102723	MW-19-116 5/17/2023 MW-19-116_051723	MW-19-116 10/27/2023 MW-19-116_102723	MW-19-117 5/18/2023 MW-19-117_051823	MW-19-117 10/27/2023 MW-19-117_102723	MW-19-118S* 10/25/2023 MW-19-118S_102523	MW-19-118D* 10/25/2023 MW-19-118D_102523	MW-19-119S* 11/1/2023 MW-19-119S_110123
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)														
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 80	< 6.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	< 40	**2.0 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	< 40	**20**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	< 40	**1.4 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 40	**3.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 40	< 3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-119D* 11/1/2023 MW-19-119D_110123	MW-19-120 5/18/2023 MW-19-120_051823	MW-19-120 10/28/2023 MW-19-120_102823	MW-19-121 2/16/2023 MW-19-121_021623	MW-19-121 5/17/2023 MW-19-121_051723	MW-19-121 8/29/2023 MW-19-121_082923	MW-19-121 10/26/2023 MW-19-121_102623	MW-19-122 2/16/2023 MW-19-122_021623	MW-19-122 5/18/2023 MW-19-122_051823	MW-19-122 8/29/2023 MW-19-122_082923	MW-19-122 10/30/2023 MW-19-122_103023	MW-19-123 2/16/2023 MW-19-123_021623
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.06	7.03	7.20	7.49	6.97	7.67	7.24	7.22	7.15	6.60	6.49	6.93
Conductivity	- -	- -	mS/cm	1.245	2.890	2.524	2.210	2.260	2.230	1.879	3.420	4.170	4.840	5.005	2.421
Turbidity	- -	- -	NTU	9.52	201.00	41.94	266.00	30.20	24.30	9.91	294.00	588.00	24.20	34.21	2.83
Dissolved oxygen (DO)	- -	- -	mg/L	0.49	0.50	2.96	10.50	4.29	7.76	10.44	9.46	6.57	1.02	3.05	6.54
Temperature	- -	- -	Deg C	10.9	17.2	14.4	6.4	13.6	17.8	17.1	8.9	13.9	17.3	12.9	11.5
Oxidation reduction potential (ORP)	- -	- -	millivolts	-49.7	-5.1	22.4	75.8	246.2	86.5	278.9	80.2	169.0	120.4	-119.5	-42.7
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**0.43***	**15**	**11**	< 1	< 1 [< 1]	< 1	< 1 [< 1]	**3**	**2**	**8**	< 4 UB	**26**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	< 25	< 25	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	< 50	< 50	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	< 50	< 50	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	< 50	< 50	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	< 2	< 2	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	< 10	< 10	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	< 5	< 5	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	< 90	< 90	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	< 2	< 2	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	< 1	< 1	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	< 2	< 2	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-119D*	MW-19-120	MW-19-120	MW-19-121	MW-19-121	MW-19-121	MW-19-121	MW-19-122	MW-19-122	MW-19-122	MW-19-122	MW-19-123
Date Collected:				11/1/2023	5/18/2023	10/28/2023	2/16/2023	5/17/2023	8/29/2023	10/26/2023	2/16/2023	5/18/2023	8/29/2023	10/30/2023	2/16/2023
Sample Name:				MW-19-119D_110123	MW-19-120_051823	MW-19-120_102823	MW-19-121_021623	MW-19-121_051723	MW-19-121_082923	MW-19-121_102623	MW-19-122_021623	MW-19-122_051823	MW-19-122_082923	MW-19-122_103023	MW-19-123_021623
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA [NA]	NA	NA [NA]	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-123 5/17/2023 MW-19-123_051723	MW-19-123 8/29/2023 MW-19-123_082923	MW-19-123 10/26/2023 MW-19-123_102623	MW-19-124 5/18/2023 MW-19-124_051823	MW-19-124 10/30/2023 MW-19-124_103023	MW-19-125* 10/25/2023 MW-19-125_102523	MW-20-126 2/16/2023 MW-20-126_021623	MW-20-126 5/18/2023 MW-20-126_051823	MW-20-126 8/30/2023 MW-20-126_083023	MW-20-126 10/30/2023 MW-20-126_103023	MW-20-127 2/16/2023 MW-20-127_021623	MW-20-127 5/17/2023 MW-20-127_051723
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.22	6.69	6.64	6.67	6.47	10.41	6.90	6.97	7.45	6.70	6.83	6.72
Conductivity	- -	- -	mS/cm	2.270	2.000	1.947	3.520	3.262	0.697	2.600	4.190	3.200	3.921	2.270	3.380
Turbidity	- -	- -	NTU	15.40	4.38	19.00	54.60	72.67	29.08	30.80	25.40	52.80	36.97	0.02	9.07
Dissolved oxygen (DO)	- -	- -	mg/L	10.19	0.53	4.10	0.24	0.62	0.66	10.89	4.06	9.61	2.36	0.40	0.72
Temperature	- -	- -	Deg C	12.0	20.0	16.5	15.2	12.2	15.4	6.9	14.8	15.3	12.2	8.5	14.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	262.4	81.5	294.9	-76.5	-53.4	-33.3	107.9	109.8	66.8	105.5	27.0	3.2
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**44**	**72**	**39**	**172**	**143**	**0.18 J***	**82**	**81**	**88 [91]**	**63**	**146**	**155**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-123 5/17/2023 MW-19-123_051723	MW-19-123 8/29/2023 MW-19-123_082923	MW-19-123 10/26/2023 MW-19-123_102623	MW-19-124 5/18/2023 MW-19-124_051823	MW-19-124 10/30/2023 MW-19-124_103023	MW-19-125* 10/25/2023 MW-19-125_102523	MW-20-126 2/16/2023 MW-20-126_021623	MW-20-126 5/18/2023 MW-20-126_051823	MW-20-126 8/30/2023 MW-20-126_083023	MW-20-126 10/30/2023 MW-20-126_103023	MW-20-127 2/16/2023 MW-20-127_021623	MW-20-127 5/17/2023 MW-20-127_051723
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-127 8/30/2023 MW-20-127_083023	MW-20-127 10/26/2023 MW-20-127_102623	MW-20-128 5/17/2023 MW-20-128_051723	MW-20-128 10/26/2023 MW-20-128_102623	MW-20-129 2/16/2023 MW-20-129_021623	MW-20-129 5/18/2023 MW-20-129_051823	MW-20-129 8/29/2023 MW-20-129_082923	MW-20-129 10/30/2023 MW-20-129_103023	MW-20-130 5/18/2023 MW-20-130_051823	MW-20-130 10/27/2023 MW-20-130_102723	MW-20-131 2/14/2023 MW-20-131	MW-20-131 5/23/2023 MW-20-131_052323
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.63	6.58	7.62	7.70	6.96	6.83	6.99	6.75	6.76	6.46	7.11	7.17
Conductivity	- -	- -	mS/cm	3.150	2.663	3.410	2.913	2.400	1.980	2.000	1.995	1.130	1.681	4.800	3.660
Turbidity	- -	- -	NTU	3.11	50.00	398.00	2822.00	136.00	3.06	9.61	40.99	1.38	45.93	9.14	1.84
Dissolved oxygen (DO)	- -	- -	mg/L	0.32	0.00	7.58	11.62	0.79	0.21	0.71	0.38	1.81	1.04	0.22	0.40
Temperature	- -	- -	Deg C	17.4	16.1	16.2	18.1	6.9	12.1	21.2	11.1	13.6	16.2	9.3	13.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	16.5	18.0	243.6	279.0	-19.8	48.3	93.9	-54.4	-57.6	38.4	-5.2	4.5
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
1,4-Dioxane	7.2	280	µg/L	**180 Y**	**132**	**4**	< 1 UB	**71**	**103**	**74**	**71**	**6**	**75**	NA [NA]	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 25 [< 25]	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2 [2]**	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10 [< 10]	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 90 [< 90]	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3 [2]**	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-127	MW-20-127	MW-20-128	MW-20-128	MW-20-129	MW-20-129	MW-20-129	MW-20-129	MW-20-130	MW-20-130	MW-20-131	MW-20-131
Date Collected:				8/30/2023	10/26/2023	5/17/2023	10/26/2023	2/16/2023	5/18/2023	8/29/2023	10/30/2023	5/18/2023	10/27/2023	2/14/2023	5/23/2023
Sample Name:				MW-20-127_083023	MW-20-127_102623	MW-20-128_051723	MW-20-128_102623	MW-20-129_021623	MW-20-129_051823	MW-20-129_082923	MW-20-129_103023	MW-20-130_051823	MW-20-130_102723	MW-20-131	MW-20-131_052323
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1 UQ	< 6.9	NA [NA]	< 7.2 UQ
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1 UQ	< 6.9	NA [NA]	< 7.2 UQ
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 7.1	< 6.9	NA [NA]	< 7.2
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**27**	**39**	NA [NA]	**1.4 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**19**	**30**	NA [NA]	**25**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**9.7**	**17**	NA [NA]	**21**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**4.8**	**8.3**	NA [NA]	**1.7 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**47**	**70**	NA [NA]	**24**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	**1.3 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	**3.3 J**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**3.3 J**	**6.6**	NA [NA]	**32**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**7.8**	**13**	NA [NA]	< 3.6
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**28**	**45**	NA [NA]	**29**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	NA [NA]	< 3.6

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-131 8/29/2023 MW-20-131_082923	MW-20-131 10/31/2023 MW-20-131_103123	MW-20-132 2/14/2023 MW-20-132_021423	MW-20-132 5/23/2023 MW-20-132_052323	MW-20-132 8/29/2023 MW-20-132_082923	MW-20-132 10/31/2023 MW-20-132_103123	MW-21-133 5/24/2023 MW-21-133_052423	MW-21-133 11/1/2023 MW-21-133_110123	MW-21-134 5/24/2023 MW-21-134_052423	MW-21-134 11/1/2023 MW-21-134_110123	MW-21-135 5/24/2023 MW-21-135_052423	MW-21-135 11/1/2023 MW-21-135_110123
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.10	7.13	7.10	7.25	7.02	7.10	7.08	7.10	7.17	7.18	7.44	7.24
Conductivity	- -	- -	mS/cm	4.110	3.785	5.870	1.810	4.800	3.919	0.650	0.903	0.560	0.811	0.700	0.847
Turbidity	- -	- -	NTU	1.22	7.27	15.80	1.91	1.09	8.00	0.88	3.47	1.24	3.39	2.92	55.90
Dissolved oxygen (DO)	- -	- -	mg/L	0.16	0.00	0.24	0.30	0.21	0.00	0.37	0.74	2.60	1.16	1.69	0.95
Temperature	- -	- -	Deg C	19.8	15.3	10.0	12.4	17.2	15.0	11.2	12.4	11.0	11.5	12.6	11.1
Oxidation reduction potential (ORP)	- -	- -	millivolts	-17.4	5.7	-36.9	-104.1	-49.6	-87.5	90.3	155.9	89.6	157.8	-55.7	-79.9
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	< 25	NA	< 25	NA [NA]	< 25	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	< 50	NA	< 50	NA [NA]	< 50	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	< 50	NA	< 50	NA [NA]	< 50	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	< 50	NA	< 50	NA [NA]	< 50	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	< 2	NA	< 2	NA [NA]	< 2	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	**2**	NA	**6**	NA [NA]	**7**	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	< 10	NA	< 10	NA [NA]	< 10	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	< 5	NA	< 5	NA [NA]	< 5	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	< 90 UJ	NA	< 90	NA [NA]	< 90	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	**2**	NA	**3**	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	< 2	NA	< 2	NA [NA]	< 2	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	< 1	NA	< 1	NA [NA]	< 1	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	< 2	NA	< 2	NA [NA]	< 2	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-131 8/29/2023 MW-20-131_082923	MW-20-131 10/31/2023 MW-20-131_103123	MW-20-132 2/14/2023 MW-20-132_021423	MW-20-132 5/23/2023 MW-20-132_052323	MW-20-132 8/29/2023 MW-20-132_082923	MW-20-132 10/31/2023 MW-20-132_103123	MW-21-133 5/24/2023 MW-21-133_052423	MW-21-133 11/1/2023 MW-21-133_110123	MW-21-134 5/24/2023 MW-21-134_052423	MW-21-134 11/1/2023 MW-21-134_110123	MW-21-135 5/24/2023 MW-21-135_052423	MW-21-135 11/1/2023 MW-21-135_110123
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
4:2 FTS	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 UQ [< 7.4 UQ]	NA	< 7.0	< 7.3 UQ	< 7.0	< 7.3 UQ	< 7.0	< 7.3 UQ	< 7.0 UJ
6:2 FTS	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4 UQ]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
8:2 FTS	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
ADONA	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	< 6.8	NA	< 7.2 [< 7.4]	NA	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0	< 7.3	< 7.0
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	**2.0 J**	NA	**1.2 J [1.1 J]**	NA	**2.6 J**	**1.0 J**	**3.2 J**	**1.9 J**	**2.5 J**	**1.5 J**	**1.8 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	**21**	NA	**8.9 [8.9]**	NA	**20**	**5.1**	**43**	**10**	**15**	**10**	**11**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	**0.57 J**	NA	**1.1 J [0.91 J]**	NA	**2.8 J**	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	**1.2 J**	< 3.5	< 3.7	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	**28**	NA	**7.7 [7.4]**	NA	**29**	**5.5**	**61**	**17**	**24**	**44**	**47**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	**3.5**	NA	**0.82 J [0.86 J]**	NA	**3.5**	**1.3 J**	**4.5**	**1.9 J**	**3.2 J**	**2.3 J**	**3.1 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	**29**	NA	**8.0 [8.4]**	NA	**28**	**6.5**	**68**	**21**	**29**	**30**	**34**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	**3.2 J**	NA	**2.1 J [2.5 J]**	NA	**8.0**	**0.60 J**	**3.5**	**0.55 J**	**0.98 J**	**1.4 J**	**2.2 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	**5.6**	NA	**6.9 [6.9]**	NA	**19**	**4.3**	**8.9**	**4.2**	**5.9**	< 3.7	**2.8 J**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	**45**	NA	**13 [14]**	NA	**50**	**16**	**110**	**29**	**40**	**47**	**63 J**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	**0.57 J**	**0.71 J**	**1.0 J**	**1.2 J**
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	**30**	NA	**8.7 [8.8]**	NA	**29**	**4.3**	**48**	**18**	**27**	**23**	**25**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	< 3.4	NA	< 3.6 [< 3.7]	NA	< 3.5	< 3.6	< 3.5	< 3.6	< 3.5	< 3.7	< 3.5

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-136 10/30/2023 MW-21-136_103023	MW-21-137 10/30/2023 MW-21-137_103023	MW-21-138 10/30/2023 MW-21-138_103023	MW-21-139 2/15/2023 MW-21-139_021523	MW-21-139 5/16/2023 MW-21-139_051623	MW-21-139 10/25/2023 MW-21-139_102523	MW-21-140 2/16/2023 MW-21-140_021623	MW-21-140 5/18/2023 MW-21-140_051823	MW-21-140 10/28/2023 MW-21-140_102823	MW-21-141 5/18/2023 MW-21-141_051823	MW-21-141 10/30/2023 MW-21-141_103023	MW-21-142 5/18/2023 MW-21-142_051823
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.33	6.88	7.04	7.63	7.66	7.73	6.95	7.14	7.18	6.67	NR	6.65
Conductivity	- -	- -	mS/cm	0.930	0.955	1.487	1.536	1.410	1.304	0.815	0.830	0.823	0.740	NR	2.200
Turbidity	- -	- -	NTU	4.34	3.46	15.71	1.22	1.18	1.79	6.41	18.80	11.22	1.79	NR	57.00
Dissolved oxygen (DO)	- -	- -	mg/L	0.47	0.44	0.29	0.07	0.13	0.22	0.25	8.95	0.44	0.31	NR	0.48
Temperature	- -	- -	Deg C	13.6	13.9	11.5	7.7	13.4	17.1	12.0	11.6	13.1	13.5	NR	15.4
Oxidation reduction potential (ORP)	- -	- -	millivolts	-53.3	100.9	-34.7	-168.0	130.1	-112.0	-127.8	7.4	-42.8	-81.5	NR	79.7
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	**2**	**2 [2]**	< 1 UB	< 1	< 1	< 1	< 1	< 1 [< 1]	**82**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 25	NA	NA	NA	NA [NA]	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 50	NA	NA	NA	NA [NA]	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 50	NA	NA	NA	NA [NA]	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 50	NA	NA	NA	NA [NA]	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 2	NA	NA	NA	NA [NA]	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 10	NA	NA	NA	NA [NA]	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 5	NA	NA	NA	NA [NA]	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 90	NA	NA	NA	NA [NA]	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 2	NA	NA	NA	NA [NA]	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 1	NA	NA	NA	NA [NA]	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA [NA]	NA	< 2	NA	NA	NA	NA [NA]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-136 10/30/2023 MW-21-136_103023	MW-21-137 10/30/2023 MW-21-137_103023	MW-21-138 10/30/2023 MW-21-138_103023	MW-21-139 2/15/2023 MW-21-139_021523	MW-21-139 5/16/2023 MW-21-139_051623	MW-21-139 10/25/2023 MW-21-139_102523	MW-21-140 2/16/2023 MW-21-140_021623	MW-21-140 5/18/2023 MW-21-140_051823	MW-21-140 10/28/2023 MW-21-140_102823	MW-21-141 5/18/2023 MW-21-141_051823	MW-21-141 10/30/2023 MW-21-141_103023	MW-21-142 5/18/2023 MW-21-142_051823
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
4:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9 Q	< 69 [< 68]	< 6.9 Q	< 7.1	NA	NA	NA	NA [NA]	NA
6:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	**46 S**	**46 J [48 J]**	**53 J**	< 7.1	NA	NA	NA	NA [NA]	NA
8:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	**32**	**54 J [56 J]**	**55**	< 7.1	NA	NA	NA	NA [NA]	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
ADONA	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.9	< 7.0	< 6.9	< 6.9	< 69 [< 68]	< 6.9	< 7.1	NA	NA	NA	NA [NA]	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**0.96 J**	< 3.5	< 3.5	**31**	**15 J [14 J]**	**21**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**1.9 J**	< 3.5	< 3.5	**40**	**47 [44]**	**48**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	**4.1**		**7.6**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	**20**	**27 J [23 J]**	**29**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	**56**	**76 [64]**	**73**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	< 3.4	< 3.5	< 3.5	**260 S**	**250 [230]**	**300**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**0.78 J**	< 3.5	< 3.5	**99**	**96 [92]**	**92**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	**0.66 J**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 3.4	< 3.5	< 3.5	**15**	**27 J [21 J]**	**22**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 3.4	< 3.5	< 3.5	**1000**	**1700 [1600]**	**2100 EJ**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	< 3.4	< 3.5	< 3.5	**79**	**91 [75]**	**100**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	**36**	**20 J [18 J]**	**30**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**0.73 J**	< 3.5	< 3.5	**94**	**92 [100]**	**91**	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.4	< 3.5	< 3.5	< 3.4	< 34 [< 34]	< 3.5	< 3.6	NA	NA	NA	NA [NA]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-142 10/30/2023 MW-21-142_103023	MW-22-143 2/13/2023 MW-22-143_021323	MW-22-143 5/19/2023 MW-22-143_051923	MW-22-143 8/28/2023 MW-22-143_082823	MW-22-143 10/30/2023 MW-22-143_103023	MW-22-144 2/13/2023 MW-22-144_021323	MW-22-144 5/18/2023 MW-22-144_051823	MW-22-144 8/28/2023 MW-22-144_082823	MW-22-144 10/30/2023 MW-22-144_103023	MW-22-145 2/13/2023 MW-22-145_021323	MW-22-145 5/18/2023 MW-22-145_051823	MW-22-145 8/28/2023 MW-22-145_082823
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.56	6.97	6.95	7.03	7.12	6.94	7.01	7.08	7.18	6.98	7.02	7.06
Conductivity	- -	- -	mS/cm	2.821	3.191	3.435	2.800	3.140	1.274	1.216	1.290	1.334	1.128	1.074	1.190
Turbidity	- -	- -	NTU	167.31	3.22	3.12	9.87	20.79	2.95	0.05	9.47	6.47	1.89	3.20	7.31
Dissolved oxygen (DO)	- -	- -	mg/L	0.21	0.30	0.24	0.25	0.26	0.48	0.99	0.27	0.29	3.22	2.20	0.42
Temperature	- -	- -	Deg C	11.7	12.6	12.7	16.0	13.1	11.7	11.1	17.6	14.2	10.6	11.0	17.7
Oxidation reduction potential (ORP)	- -	- -	millivolts	-0.5	-98.6	-63.9	108.2	-77.2	-132.8	84.0	87.7	57.5	-110.7	161.1	82.6
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**70**	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA [NA]	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-142 10/30/2023 MW-21-142_103023	MW-22-143 2/13/2023 MW-22-143_021323	MW-22-143 5/19/2023 MW-22-143_051923	MW-22-143 8/28/2023 MW-22-143_082823	MW-22-143 10/30/2023 MW-22-143_103023	MW-22-144 2/13/2023 MW-22-144_021323	MW-22-144 5/18/2023 MW-22-144_051823	MW-22-144 8/28/2023 MW-22-144_082823	MW-22-144 10/30/2023 MW-22-144_103023	MW-22-145 2/13/2023 MW-22-145_021323	MW-22-145 5/18/2023 MW-22-145_051823	MW-22-145 8/28/2023 MW-22-145_082823
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
4:2 FTS	- -	- -	ng/L	NA	< 6.9 UQ	< 7.1 UQ	< 7.4 UQ [< 7.4 UQ]	< 6.9	< 7.0	< 6.9	< 7.3 UQ	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
6:2 FTS	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.3 [< 6.7]	< 6.9	< 7.0	< 6.9	< 6.8	< 7.1 [< 6.8]	< 7.0	< 7.3	**3.1 BJ**
8:2 FTS	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 6.7]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
ADONA	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.4 [< 7.4]	< 6.9	< 7.0	< 6.9	< 7.3	< 7.1 [< 6.8]	< 7.0	< 7.3	< 6.8
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	**1.3 J**	**0.79 J**	**1.3 J [1.3 J]**	**1.3 J**	**2.0 J**	**2.2 J**	**1.6 J**	**2.3 J [2.5 J]**	**3.4 J**	**2.8 J**	**1.9 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	**11**	**11**	**10 [10]**	**10**	**3.2 J**	**8.0**	**4.1**	**4.3 [4.3]**	**4.9**	**11**	**7.9**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	**0.45 J**	< 3.4
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	**6.4**	**3.9**	**6.6 [6.2]**	**5.6**	**2.6 J**	**6.8**	**3.9**	**3.5 [3.5]**	**3.9**	**15**	**9.9**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	**4.5**	**3.0 J**	**4.7**	**6.7 [6.5]**	**1.7 J**	**3.3 J**	**3.1 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	**17**	**14**	**14 [15]**	**13**	**4.4**	**15**	**8.0**	**6.6 [6.6]**	**5.5**	**25**	**19**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	**1.0 J**	< 3.4
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	**7.3**	< 3.4
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	**5.5**	**3.7**	**6.5 [6.3]**	**5.4**	**5.0**	**12**	**7.5**	**6.4 [6.4]**	**11**	**32**	**19**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	**0.84 J**	< 3.4
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	**14**	**14**	**11 [11]**	**12**	**3.7**	**15**	**7.4**	**5.7 [5.2]**	**5.1**	**22**	**18**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.7 [< 3.7]	< 3.4	< 3.5	< 3.4	< 3.7	< 3.5 [< 3.4]	< 3.5	< 3.6	< 3.4

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-145 10/30/2023 MW-22-145_103023	MW-22-146 2/13/2023 MW-22-146_021323	MW-22-146 5/18/2023 MW-22-146_051823	MW-22-146 8/28/2023 MW-22-146_082823	MW-22-146 10/31/2023 MW-22-146_103123	MW-22-147 2/14/2023 MW-22-147_021423	MW-22-147 5/19/2023 MW-22-147_051923	MW-22-147 8/28/2023 MW-22-147_082823	MW-22-147 10/31/2023 MW-22-147_103123	MW-22-148 2/14/2023 MW-22-148_021423	MW-22-148 5/24/2023 MW-22-148_052423	MW-22-148 8/28/2023 MW-22-148_082823
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.19	7.20	7.44	7.18	7.20	7.28	7.19	6.90	7.10	7.25	7.32	6.97
Conductivity	- -	- -	mS/cm	1.217	0.993	0.792	0.890	0.951	1.660	1.389	1.260	1.540	0.890	0.710	0.740
Turbidity	- -	- -	NTU	3.65	2.14	4.25	8.13	8.74	32.00	0.41	3.59	9.52	11.00	3.12	4.95
Dissolved oxygen (DO)	- -	- -	mg/L	0.29	6.93	6.74	3.67	6.06	1.65	5.07	7.51	2.46	0.40	2.43	1.86
Temperature	- -	- -	Deg C	15.1	8.4	10.4	16.8	13.0	10.3	10.6	16.7	14.5	12.2	12.5	14.4
Oxidation reduction potential (ORP)	- -	- -	millivolts	1.0	-66.2	197.2	72.0	108.3	-2.2	85.9	60.7	92.4	6.4	99.1	61.8
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-145 10/30/2023 MW-22-145_103023	MW-22-146 2/13/2023 MW-22-146_021323	MW-22-146 5/18/2023 MW-22-146_051823	MW-22-146 8/28/2023 MW-22-146_082823	MW-22-146 10/31/2023 MW-22-146_103123	MW-22-147 2/14/2023 MW-22-147_021423	MW-22-147 5/19/2023 MW-22-147_051923	MW-22-147 8/28/2023 MW-22-147_082823	MW-22-147 10/31/2023 MW-22-147_103123	MW-22-148 2/14/2023 MW-22-148_021423	MW-22-148 5/24/2023 MW-22-148_052423	MW-22-148 8/28/2023 MW-22-148_082823
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
4:2 FTS	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1 UQ	< 6.9 UQ	< 7.2	< 6.8	< 7.0 UQ	< 7.0 UQ	< 6.7	< 7.0	< 7.4	< 6.8
6:2 FTS	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	**13 Q**	< 7.4	**2.1 J**	< 6.8	< 7.0	< 6.8	**2.1 J**	< 7.0	< 7.4	< 6.8
8:2 FTS	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
ADONA	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7 UJ	< 7.0	< 7.4	< 6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.8	< 6.9 [< 7.0]	< 7.1	< 6.9	< 7.2	< 6.8	< 7.0	< 7.0	< 6.7	< 7.0	< 7.4	< 6.8
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**2.5 J**	**2.3 J [2.2 J]**	**4.8**	**2.9 J**	**3.0 J**	**2.1 J**	**3.0 J**	**2.9 J**	**3.9**	**1.7 J**	**1.4 J**	**1.5 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**6.5**	**7.1 [6.8]**	**13**	**6.7**	**7.7**	**5.4**	**4.8**	**7.2**	**7.4**	**0.88 J**	< 3.7	**1.4 J**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**8.5**	< 3.5 [< 3.5]	**0.90 J**	< 3.4	< 3.6	**0.98 J**	**0.97 J**	**1.0 J**	**1.5 J**	< 3.5	< 3.7	< 3.4
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**4.6**	**0.60 J [0.57 J]**	**0.97 J**	**0.95 J**	**0.92 J**	**1.6 J**	**1.4 J**	**2.6 J**	**2.7 J**	< 3.5	< 3.7	< 3.4
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**16**	< 3.5 [< 3.5]	**3.5**	**0.95 J**	< 3.6	**1.7 J**	**1.4 J**	**2.4 J**	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.4		< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	**0.65 J**	< 3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 3.4	**1.8 J [1.9 J]**	**3.7**	**2.7 J**	**3.1 J**	**1.9 J**	< 3.5	**2.5 J**	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**19**	**1.7 J [1.6 J]**	**4.5**	**1.8 J**	**3.0 J**	**3.6**	**2.7 J**	**4.6**	**5.0**	< 3.5	< 3.7	< 3.4
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**14**	< 3.5 [< 3.5]	**2.9 J**	**0.71 J**	**0.77 J**	**2.1 J**	**1.3 J**	**2.5 J**	**2.6 J**	< 3.5	< 3.7	< 3.4
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.4	< 3.5 [< 3.5]	< 3.5	< 3.4	< 3.6	< 3.4	< 3.5	< 3.5	< 3.4	< 3.5	< 3.7	< 3.4

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-148	MW-22-149	MW-22-149	MW-22-149	MW-22-149	MW-22-150	MW-22-150	MW-22-150	MW-22-150	MW-22-151	MW-22-151	MW-22-151
Date Collected:				10/31/2023	2/13/2023	5/19/2023	8/28/2023	10/31/2023	2/13/2023	5/24/2023	8/28/2023	10/31/2023	2/13/2023	5/23/2023	8/28/2023
Sample Name:				MW-22-148_103123	MW-22-149_021323	MW-22-149_051923	MW-22-149_082823	MW-22-149_103123	MW-22-150_021323	MW-22-150_052423	MW-22-150_082823	MW-22-150_103123	MW-22-151_021323	MW-22-151_052323	MW-22-151_082823
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.11	7.45	7.34	7.12	7.20	7.37	7.31	7.21	7.14	6.89	6.92	6.78
Conductivity	- -	- -	mS/cm	0.893	0.569	0.567	0.510	0.549	4.790	3.380	3.780	4.413	2.670	1.840	2.150
Turbidity	- -	- -	NTU	14.56	7.84	1.19	2.03	5.04	9.23	2.10	30.90	38.26	35.80	14.90	16.50
Dissolved oxygen (DO)	- -	- -	mg/L	0.68	6.87	6.53	5.25	6.56	0.36	0.17	0.23	0.90	0.40	0.10	0.18
Temperature	- -	- -	Deg C	11.7	7.6	11.8	18.6	13.6	9.3	11.5	17.3	14.4	11.0	13.5	18.1
Oxidation reduction potential (ORP)	- -	- -	millivolts	85.1	0.9	162.1	78.8	158.2	32.0	-72.9	6.6	9.7	-21.5	-79.1	-49.4
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-148	MW-22-149	MW-22-149	MW-22-149	MW-22-149	MW-22-150	MW-22-150	MW-22-150	MW-22-150	MW-22-151	MW-22-151	MW-22-151
Date Collected:				10/31/2023	2/13/2023	5/19/2023	8/28/2023	10/31/2023	2/13/2023	5/24/2023	8/28/2023	10/31/2023	2/13/2023	5/23/2023	8/28/2023
Sample Name:				MW-22-148_103123	MW-22-149_021323	MW-22-149_051923	MW-22-149_082823	MW-22-149_103123	MW-22-150_021323	MW-22-150_052423	MW-22-150_082823	MW-22-150_103123	MW-22-151_021323	MW-22-151_052323	MW-22-151_082823
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	< 7.5	< 6.8
4:2 FTS	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7 UQ	< 7.4 UQ	< 7.2 UQ	< 6.9	< 6.8 UQ	< 7.5 UQ	< 6.8 UQ
6:2 FTS	- -	- -	ng/L	< 7.4	**7.7**	< 7.0	< 7.1	< 7.0	< 6.7 UQ	< 7.4	< 6.9 UQ	< 6.9	< 6.8 UQ	< 7.5 UQ	< 7.2 UQ
8:2 FTS	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8 UQ	< 7.5	< 6.8 UQ
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	< 7.5	< 6.8
ADONA	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	**0.94 J**	< 6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	< 7.5	< 6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	< 7.5	< 6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 7.4	< 6.7	< 7.0	< 7.1	< 7.0	< 6.7	< 7.4	< 7.2	< 6.9	< 6.8	< 7.5	< 6.8
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**1.8 J**	**1.0 J**	**0.76 J**	**1.0 J**	**0.91 J**	< 3.3	< 3.7	< 3.6	< 3.4	**8.3**	**7.9**	**8.9**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**0.84 J**	**0.52 J**	< 3.5	**0.73 J**	**0.59 J**	**2.6 J**	**2.7 J**	**2.5 J**	**2.7 J**	**12**	**11**	**9.5**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.7	**2.7 J**	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	**0.53 J**	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	**3.6**	**3.1 J**	**3.3 J**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	< 3.7	**0.52 J**	**0.75 J**	**0.93 J**	**0.80 J**	< 3.3	< 3.7	< 3.6	< 3.4	**1.1 J**	**1.4 J**	**3.0 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	**5.6**	**6.7**	**7.0**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	< 3.7	**0.66 J**	**0.51 J**	**0.95 J**	**0.56 J**	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	**0.54 J**	**0.59 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 3.7	**1.9 J**	< 3.5	**2.3 J**	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	**3.7**	**4.0**	**4.9**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	< 3.7	**1.3 J**	**1.3 J**	**1.6 J**	**1.3 J**	< 3.3	< 3.7	< 3.6	< 3.4	**8.0**	**8.6**	**8.0**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	**4.0**	**1.3 J**	**1.3 J**	**1.7 J**	**13**	**12**	**13**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.7	< 3.4	< 3.5	< 3.6	< 3.5	< 3.3	< 3.7	< 3.6	< 3.4	< 3.4	< 3.7	< 3.4

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-151	MW-22-152	MW-22-152	MW-22-152	MW-22-152	MW-22-153	MW-22-153	MW-22-153	MW-22-153	MW-22-154	MW-22-154	MW-22-154
Date Collected:				10/31/2023	2/13/2023	5/23/2023	8/28/2023	10/27/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/13/2023	5/1/2023	8/29/2023
Sample Name:				MW-22-151_103123	MW-22-152_021323	MW-22-152_052323	MW-22-152_082823	MW-22-152_102723	MW-22-153_021523	MW-22-153_051723	MW-22-153_082923	MW-22-153_102423	MW-22-154_021323	MW-22-154_050123	MW-22-154_082923
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.65	7.01	7.02	6.75	7.10	6.98	7.09	7.03	7.02	6.95	7.21	6.78
Conductivity	- -	- -	mS/cm	2.891	1.250	0.850	0.850	1.062	2.264	2.250	1.250	1.562	5.370	2.470	9.490
Turbidity	- -	- -	NTU	8.90	7.34	0.97	2.03	3.12	1.09	0.02	12.60	36.00	7.88	3.01	1.55
Dissolved oxygen (DO)	- -	- -	mg/L	0.13	0.15	0.14	0.18	0.17	0.12	0.06	0.19	0.00	0.44	0.20	0.37
Temperature	- -	- -	Deg C	15.3	11.2	12.8	16.5	16.1	12.9	12.7	17.6	15.2	9.8	9.3	15.9
Oxidation reduction potential (ORP)	- -	- -	millivolts	-54.2	-13.9	-30.8	30.8	133.3	-181.6	109.7	-55.1	-58.7	-3.7	32.0	37.0
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	**54**	**52**	< 1	**37**	< 1	< 1	< 1 [< 1]
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA [NA]	NA	NA [NA]	**26**	**61**	**18**	**101**	NA	NA	NA [NA]
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	< 25 [< 25]	NA	< 25 [< 25]	< 25	< 25	< 25	< 25	< 25	< 25	< 25 [< 25]
2-Hexanone	1,000	- -	µg/L	NA	NA	< 50 [< 50]	NA	< 50 [< 50]	< 50	< 50	< 50	< 50	< 50	< 50	< 50 [< 50]
2-Methylnaphthalene	260	19	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	< 50 [< 50]	NA	< 50 [< 50]	< 50	< 50	< 50	< 50	< 50	< 50	< 50 [< 50]
Acetone	730	1,700	µg/L	NA	NA	< 50 [< 50]	NA	< 50 [< 50]	< 50	< 50	< 50	< 50	< 50	< 50	< 50 [< 50]
Acrylonitrile	2.6	2.0	µg/L	NA	NA	< 2 [< 2]	NA	< 2 [< 2]	< 2	< 2	< 2	< 2	< 2	< 2	< 2 [< 2]
Benzene	5.0	200	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Bromobenzene	18	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Bromodichloromethane	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Bromoform	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Carbon disulfide	800	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Carbon tetrachloride	5.0	38	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Chlorobenzene	100	25	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Chlorobromomethane	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Chloroethane	430	1,100	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	**3**	< 1	**3 [3]**
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Dibromochloromethane	80	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Dibromomethane	80	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Ethyl ether	10	- -	µg/L	NA	NA	< 10 [< 10]	NA	< 10 [< 10]	< 10	< 10	< 10	< 10	< 10	< 10	< 10 [< 10]
Ethylbenzene	74	18	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Hexachloroethane	7.3	6.7	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Iodomethane	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Isopropyl benzene	800	28	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Methylene chloride	5.0	1,500	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
Naphthalene	520	11	µg/L	NA	NA	< 5 [< 5]	NA	< 5 [< 5]	< 5	< 5	< 5	< 5	< 5	< 5	< 5 [< 5]
N-Butylbenzene	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
N-Propylbenzene	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Styrene	100	80	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
tert-Butylbenzene	80	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Tetrachloroethene	5.0	60	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Tetrahydrofuran	95	11,000	µg/L	NA	NA	< 90 [< 90]	NA	< 90 [< 90]	< 90	< 90	< 90	< 90	< 90	< 90	< 90 UJ [< 90 UJ]
Toluene	790	270	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Trichloroethene	5.0	200	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Vinyl chloride	2.0	13	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	**1 [1]**
m&p-Xylene	- -	- -	µg/L	NA	NA	< 2 [< 2]	NA	< 2 [< 2]	< 2	< 2	< 2	< 2	< 2	< 2	< 2 [< 2]
o-Xylene	- -	- -	µg/L	NA	NA	< 1 [< 1]	NA	< 1 [< 1]	< 1	< 1	< 1	< 1	< 1	< 1	< 1 [< 1]
Xylenes (total)	280	49	µg/L	NA	NA	< 2 [< 2]	NA	< 2 [< 2]	< 2	< 2	< 2	< 2	< 2	< 2	< 2 [< 2]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-151	MW-22-152	MW-22-152	MW-22-152	MW-22-152	MW-22-153	MW-22-153	MW-22-153	MW-22-153	MW-22-154	MW-22-154	MW-22-154
Date Collected:				10/31/2023	2/13/2023	5/23/2023	8/28/2023	10/27/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/13/2023	5/1/2023	8/29/2023
Sample Name:				MW-22-151_103123	MW-22-152_021323	MW-22-152_052323	MW-22-152_082823	MW-22-152_102723	MW-22-153_021523	MW-22-153_051723	MW-22-153_082923	MW-22-153_102423	MW-22-154_021323	MW-22-154_050123	MW-22-154_082923
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
4:2 FTS	- -	- -	ng/L	< 6.9	< 6.9 UQ	< 7.4 [< 7.5 UQ]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
6:2 FTS	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 6.8	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
8:2 FTS	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
ADONA	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.9	< 6.9	< 7.4 [< 7.5]	< 7.2	< 7.0 [< 7.0]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	**8.3**	**11**	**6.0 [6.2]**	**14**	**18 [17]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**13**	**6.0**	**5.1 [5.1]**	**5.2**	**6.2 [6.0]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**4.1**	**1.6 J**	**1.6 J [1.4 J]**	**1.5 J**	**1.8 J [2.0 J]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	**2.5 J**	**4.9**	**4.0 [3.9]**	**3.9**	**4.9 [5.3]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**7.6**	**3.7**	**2.9 J [3.1 J]**	**3.1 J**	**3.2 J [3.3 J]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	**0.61 J**	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**7.1**	**2.4 J**	< 3.7 [< 3.7]	**2.7 J**	**2.9 J [3.1 J]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	**8.7**	**5.4**	**4.0 [4.0]**	**5.5**	**5.7 [5.7]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	< 3.4	**0.55 J**	< 3.7 [< 3.7]	< 3.6	**0.64 J [0.82 J]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**17**	**5.9**	**3.8 [3.9]**	**4.1**	**4.2 [4.4]**	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	R	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.4	< 3.4	< 3.7 [< 3.7]	< 3.6	< 3.5 [< 3.5]	NA	NA	NA	NA	NA	NA	NA [NA]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-154	MW-22-155	MW-22-155	MW-22-155	MW-22-155	MW-22-156	MW-22-156	MW-22-156	MW-22-156	MW-22-157	MW-22-157	MW-22-157
Date Collected:				10/27/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/15/2023	5/17/2023	8/29/2023
Sample Name:				MW-22-154_102723	MW-22-155_021523	MW-22-155_051723	MW-22-155_082923	MW-22-155_102423	MW-22-156_021523	MW-22-156_051723	MW-22-156_082923	MW-22-156_102423	MW-22-157_021523	MW-22-157_051723	MW-22-157_082923
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.76	6.99	7.91	6.91	7.03	7.02	7.19	7.14	7.10	7.01	7.00	6.90
Conductivity	- -	- -	mS/cm	12.019	2.020	0.000	1.880	2.410	1.968	2.080	1.150	1.699	1.986	1.482	1.440
Turbidity	- -	- -	NTU	3.89	5.79	39.80	107.00	64.94	1.12	1.13	10.20	261.00	1.61	0.58	15.10
Dissolved oxygen (DO)	- -	- -	mg/L	0.21	0.86	7.90	2.00	0.11	0.57	0.24	0.07	0.00	0.11	0.23	0.10
Temperature	- -	- -	Deg C	15.7	12.0	20.1	19.0	15.3	13.1	12.7	17.4	18.2	13.0	14.1	18.4
Oxidation reduction potential (ORP)	- -	- -	millivolts	54.0	-182.6	-64.0	-53.8	-117.3	-170.5	123.6	-57.9	-88.3	-157.7	-59.6	-34.3
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	< 1	< 1	< 1	NA	< 1	**463 E**	**471 E**	**300 Y**	**280 Y**	NA	NA	< 1 [< 1]
1,1-Dichloroethene	7.0	130	µg/L	< 1	< 1	< 1	NA	< 1	**25**	**38**	**20 Y**	**20 Y**	NA	NA	< 1 [< 1]
1,1,1-Trichloroethane	200	89	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,1,1,2-Tetrachloroethane	77	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,1,2-Trichloroethane	5.0	330	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2-Dichlorobenzene	600	13	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2-Dichloroethane	5.0	360	µg/L	< 1	< 1	< 1	NA	< 1	**1**	**1**	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2-Dichloropropane	5.0	230	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2,3-Trichlorobenzene	- -	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
1,2,3-Trichloropropane	42	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2,3-Trimethylbenzene	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,2,4-Trichlorobenzene	70	99	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
1,2,4-Trimethylbenzene	63	17	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,3-Dichlorobenzene	6.6	28	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,3,5-Trimethylbenzene	72	45	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,4-Dichlorobenzene	75	17	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
1,4-Dioxane	7.2	280	µg/L	NA	**36**	**270 Y**	**160 Y**	**176**	**47**	**101**	**144**	**140 Y**	**5**	**44**	**123 [117]**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	< 25	< 25	< 25	NA	< 25	< 25	< 25	< 250 UY	< 250 Y	NA	NA	< 25 [< 25]
2-Hexanone	1,000	- -	µg/L	< 50	< 50	< 50	NA	< 50	< 50	< 500 UY	< 500 UY	< 500 Y	NA	NA	< 50 [< 50]
2-Methylnaphthalene	260	19	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	< 50	< 50	< 50	NA	< 50	< 50	< 500 UY	< 500 UY	< 500 Y	NA	NA	< 50 [< 50]
Acetone	730	1,700	µg/L	< 50	< 50	< 50	NA	< 50	< 50	< 500 UY	< 500 UY	< 500 Y	NA	NA	< 50 [< 50]
Acrylonitrile	2.6	2.0	µg/L	< 2	< 2	< 2	NA	< 2	< 2	< 20 UY	< 20 UY	< 20 Y	NA	NA	< 2 [< 2]
Benzene	5.0	200	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Bromobenzene	18	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Bromodichloromethane	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Bromoform	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Bromomethane (Methyl bromide)	10	5.0	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Carbon disulfide	800	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Carbon tetrachloride	5.0	38	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Chlorobenzene	100	25	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Chlorobromomethane	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Chloroethane	430	1,100	µg/L	< 5	< 5	< 5	NA	< 5	**16**	**27**	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Chloroform (Trichloromethane)	80	350	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Chloromethane (Methyl chloride)	260	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
cis-1,2-Dichloroethene	70	620	µg/L	**3**	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
cis-1,3-Dichloropropene	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Dibromochloromethane	80	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Dibromomethane	80	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Ethyl ether	10	- -	µg/L	< 10	< 10	< 10	NA	< 10	< 10	< 100 UY	< 100 UY	< 100 Y	NA	NA	< 10 [< 10]
Ethylbenzene	74	18	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Hexachloroethane	7.3	6.7	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Iodomethane	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Isopropyl benzene	800	28	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 50 UY	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Methylene chloride	5.0	1,500	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
Naphthalene	520	11	µg/L	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 50 UY	< 50 Y	NA	NA	< 5 [< 5]
N-Butylbenzene	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
N-Propylbenzene	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Styrene	100	80	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
tert-Butylbenzene	80	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Tetrachloroethene	5.0	60	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Tetrahydrofuran	95	11,000	µg/L	< 90	< 90	< 90	NA	< 90	< 90	< 900 UY	< 900 UY	< 900 Y	NA	NA	< 90 [< 90]
Toluene	790	270	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
trans-1,2-Dichloroethene	100	1,500	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
trans-1,3-Dichloropropene	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Trichloroethene	5.0	200	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Vinyl chloride	2.0	13	µg/L	**2**	< 1	< 1	NA	< 1	**2**	**1**	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
m&p-Xylene	- -	- -	µg/L	< 2	< 2	< 2	NA	< 2	< 2	< 2	< 20 UY	< 20 Y	NA	NA	< 2 [< 2]
o-Xylene	- -	- -	µg/L	< 1	< 1	< 1	NA	< 1	< 1	< 10 UY	< 10 UY	< 10 Y	NA	NA	< 1 [< 1]
Xylenes (total)	280	49	µg/L	< 2	< 2	< 2	NA	< 2	< 2	< 10 UY	< 20 UY	< 20 Y	NA	NA	< 2 [< 2]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-154	MW-22-155	MW-22-155	MW-22-155	MW-22-155	MW-22-156	MW-22-156	MW-22-156	MW-22-156	MW-22-157	MW-22-157	MW-22-157
Date Collected:				10/27/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/15/2023	5/17/2023	8/29/2023	10/24/2023	2/15/2023	5/17/2023	8/29/2023
Sample Name:				MW-22-154_102723	MW-22-155_021523	MW-22-155_051723	MW-22-155_082923	MW-22-155_102423	MW-22-156_021523	MW-22-156_051723	MW-22-156_082923	MW-22-156_102423	MW-22-157_021523	MW-22-157_051723	MW-22-157_082923
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-157 10/24/2023 MW-22-157_102423	MW-22-158 2/13/2023 MW-22-158_021323	MW-22-158 5/18/2023 MW-22-158_051823	MW-22-158 8/28/2023 MW-22-158_082823	MW-22-158 10/30/2023 MW-22-158_103023	MW-22-160 2/14/2023 MW-22-160_021423	MW-22-160 5/18/2023 MW-22-160_051823	MW-22-160 8/28/2023 MW-22-160_082823	MW-22-160 10/31/2023 MW-22-160_103123	MW-23 11/3/2023 MW-23_110323	MW-23-161 10/24/2023 MW-23-161_102423	MW-23-162 10/24/2023 MW-23-162_102423
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.95	7.09	7.02	7.05	7.11	6.82	6.89	6.83	6.78	7.23	7.13	6.89
Conductivity	- -	- -	mS/cm	16.200	3.614	3.535	3.370	3.726	1.124	1.313	1.280	1.262	1.037	1.780	3.097
Turbidity	- -	- -	NTU	108.00	1.60	2.99	7.32	14.66	2.54	2.11	6.09	8.93	7.34	22.19	19.08
Dissolved oxygen (DO)	- -	- -	mg/L	0.00	0.16	0.24	0.16	0.27	0.75	0.26	0.85	0.15	0.20	0.19	0.57
Temperature	- -	- -	Deg C	16.2	11.4	11.2	16.3	12.9	12.2	11.2	16.7	13.5	13.8	14.1	14.0
Oxidation reduction potential (ORP)	- -	- -	millivolts	-63.1	-97.8	-21.2	115.9	-12.0	-167.7	-42.7	63.4	-42.4	-7.2	-75.3	-4.4
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,1-Dichloroethene	7.0	130	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,1,1-Trichloroethane	200	89	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,1,1,2-Tetrachloroethane	77	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,1,2-Trichloroethane	5.0	330	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2-Dichlorobenzene	600	13	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2-Dichloroethane	5.0	360	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2-Dichloropropane	5.0	230	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2,3-Trichlorobenzene	- -	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
1,2,3-Trichloropropane	42	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2,3-Trimethylbenzene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,2,4-Trichlorobenzene	70	99	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
1,2,4-Trimethylbenzene	63	17	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,3-Dichlorobenzene	6.6	28	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,3,5-Trimethylbenzene	72	45	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,4-Dichlorobenzene	75	17	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
1,4-Dioxane	7.2	280	µg/L	**115**	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	**54 [56]**	**28**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	< 25	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 25 [< 25]	< 25
2-Hexanone	1,000	- -	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 50 [< 50]	< 50
2-Methylnaphthalene	260	19	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 50 [< 50]	< 50
Acetone	730	1,700	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 50 [< 50]	< 50
Acrylonitrile	2.6	2.0	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 2 [< 2]	< 2
Benzene	5.0	200	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Bromobenzene	18	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Bromodichloromethane	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Bromoform	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Bromomethane (Methyl bromide)	10	5.0	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Carbon disulfide	800	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Carbon tetrachloride	5.0	38	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Chlorobenzene	100	25	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Chlorobromomethane	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Chloroethane	430	1,100	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Chloroform (Trichloromethane)	80	350	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Chloromethane (Methyl chloride)	260	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
cis-1,2-Dichloroethene	70	620	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
cis-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Dibromochloromethane	80	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Dibromomethane	80	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Ethyl ether	10	- -	µg/L	< 10	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 10 [< 10]	< 10
Ethylbenzene	74	18	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Hexachloroethane	7.3	6.7	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Iodomethane	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Isopropyl benzene	800	28	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Methylene chloride	5.0	1,500	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
Naphthalene	520	11	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 5 [< 5]	< 5
N-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
N-Propylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Styrene	100	80	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
tert-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Tetrachloroethene	5.0	60	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Tetrahydrofuran	95	11,000	µg/L	< 90	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 90 [< 90]	< 90
Toluene	790	270	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
trans-1,2-Dichloroethene	100	1,500	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
trans-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Trichloroethene	5.0	200	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Vinyl chloride	2.0	13	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
m&p-Xylene	- -	- -	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 2 [< 2]	< 2
o-Xylene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 1 [< 1]	< 1
Xylenes (total)	280	49	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	< 2 [< 2]	< 2

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: Date Collected: Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-157 10/24/2023 MW-22-157_102423	MW-22-158 2/13/2023 MW-22-158_021323	MW-22-158 5/18/2023 MW-22-158_051823	MW-22-158 8/28/2023 MW-22-158_082823	MW-22-158 10/30/2023 MW-22-158_103023	MW-22-160 2/14/2023 MW-22-160_021423	MW-22-160 5/18/2023 MW-22-160_051823	MW-22-160 8/28/2023 MW-22-160_082823	MW-22-160 10/31/2023 MW-22-160_103123	MW-23 11/3/2023 MW-23_110323	MW-23-161 10/24/2023 MW-23-161_102423	MW-23-162 10/24/2023 MW-23-162_102423
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
4:2 FTS	- -	- -	ng/L	NA	< 6.9	< 7.1 UQ	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
6:2 FTS	- -	- -	ng/L	NA	< 6.9	< 7.1	**3.5 BJ**	< 6.9	**8.3**	**6.3 J**	< 6.8 [< 6.9]	**3.2 J**	< 7.0	NA [NA]	NA
8:2 FTS	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
ADONA	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	< 6.9	< 7.1	< 7.5	< 6.9	< 6.9	< 7.1	< 7.4 [< 6.9]	< 6.9	< 7.0	NA [NA]	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	**1.3 J**	**1.5 J**	**1.5 J**	**1.6 J**	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	**4.6**	**4.7**	**5.1**	**4.8**	**0.93 J**	**1.1 J**	**1.0 J** [< 3.5]	**1.3 J**	**1.9 J**	NA [NA]	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	**1.5 J**	**1.5 J**	**1.1 J**	**1.3 J**	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	**3.1 J**	**2.8 J**	**2.5 J**	**2.5 J**	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	**3.3 J**	NA [NA]	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	< 3.5	< 3.5	**1.0 J**	**1.0 J**	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	**3.3 J**	**3.0 J**	**2.9 J**	**2.9 J**	< 3.4	< 3.5	< 3.7 **[0.52 J]**	< 3.4	< 3.5	NA [NA]	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	< 3.5	< 3.5	< 3.8	< 3.4	< 3.4	< 3.5	< 3.7 [< 3.5]	< 3.4	< 3.5	NA [NA]	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-23-163	MW-91-2R	P2-MW-02	P2-MW-04	P6-SB-07	P6-SB-07	P6-SB-18	PW-14-01	PW-14-01	PW-14-02	PW-14-02	PW-14-02
Date Collected:				10/24/2023	11/3/2023	10/25/2023	10/25/2023	2/15/2023	11/1/2023	10/31/2023	5/18/2023	10/30/2023	2/16/2023	5/18/2023	8/30/2023
Sample Name:				MW-23-163_102423	MW-91-2R_110323	P2-MW-02_102523	P2-MW-04_102523	P6-SB-07_021523	P6-SB-07_110123	P6-SB-18_103123	PW-14-01_051823	PW-14-01_103023	PW-14-02_021623	PW-14-02_051823	PW-14-02_083023
Field Parameters															
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.23	7.03	7.23	7.37	7.49	7.67	9.28	7.43	5.21	7.39	7.37	7.79
Conductivity	- -	- -	mS/cm	1.225	1.373	1.272	1.213	0.451	0.566	0.687	3.290	4.468	1.540	1.820	1.860
Turbidity	- -	- -	NTU	53.91	24.00	10.22	8.02	10.40	9.82	201.55	4.80	797.25	5.30	1.70	1.22
Dissolved oxygen (DO)	- -	- -	mg/L	0.11	0.00	0.28	0.19	0.00	2.41	0.56	8.28	0.26	9.42	7.50	9.11
Temperature	- -	- -	Deg C	14.2	14.1	14.2	14.2	12.9	9.5	12.3	19.0	11.3	7.8	14.7	16.7
Oxidation reduction potential (ORP)	- -	- -	millivolts	-102.4	-90.3	-87.8	-109.3	-105.1	23.2	7.8	68.1	57.4	95.8	-15.0	65.1
Volatile Organics (via EPA Method SW5030C/8260C)															
1,1-Dichloroethane	880	740	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,1-Dichloroethene	7.0	130	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,1,1-Trichloroethane	200	89	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,1,2-Trichloroethane	5.0	330	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2-Dichlorobenzene	600	13	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2-Dichloroethane	5.0	360	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2-Dichloropropane	5.0	230	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
1,2,3-Trichloropropane	42	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,2,4-Trichlorobenzene	70	99	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
1,2,4-Trimethylbenzene	63	17	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,3-Dichlorobenzene	6.6	28	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,3,5-Trimethylbenzene	72	45	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,4-Dichlorobenzene	75	17	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
1,4-Dioxane	7.2	280	µg/L	**12**	NA	NA	**22**	NA	NA	NA	< 1	< 2 UB	**18**	**14**	**5**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	< 25	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 25	NA
2-Hexanone	1,000	- -	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50	NA
2-Methylnaphthalene	260	19	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50	NA
Acetone	730	1,700	µg/L	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 50	NA
Acrylonitrile	2.6	2.0	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2	NA
Benzene	5.0	200	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Bromobenzene	18	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Bromodichloromethane	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Bromoform	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Carbon disulfide	800	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Carbon tetrachloride	5.0	38	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Chlorobenzene	100	25	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Chlorobromomethane	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Chloroethane	430	1,100	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Chloroform (Trichloromethane)	80	350	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
cis-1,2-Dichloroethene	70	620	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Dibromochloromethane	80	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Dibromomethane	80	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Ethyl ether	10	- -	µg/L	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10	NA
Ethylbenzene	74	18	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Hexachloroethane	7.3	6.7	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Iodomethane	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Isopropyl benzene	800	28	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Methylene chloride	5.0	1,500	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
Naphthalene	520	11	µg/L	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA
N-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
N-Propylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Styrene	100	80	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
tert-Butylbenzene	80	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Tetrachloroethene	5.0	60	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Tetrahydrofuran	95	11,000	µg/L	< 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 90	NA
Toluene	790	270	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Trichloroethene	5.0	200	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Vinyl chloride	2.0	13	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
m&p-Xylene	- -	- -	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2	NA
o-Xylene	- -	- -	µg/L	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA
Xylenes (total)	280	49	µg/L	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-23-163 10/24/2023 MW-23-163_102423	MW-91-2R 11/3/2023 MW-91-2R_110323	P2-MW-02 10/25/2023 P2-MW-02_102523	P2-MW-04 10/25/2023 P2-MW-04_102523	P6-SB-07 2/15/2023 P6-SB-07_021523	P6-SB-07 11/1/2023 P6-SB-07_110123	P6-SB-18 10/31/2023 P6-SB-18_103123	PW-14-01 5/18/2023 PW-14-01_051823	PW-14-01 10/30/2023 PW-14-01_103023	PW-14-02 2/16/2023 PW-14-02_021623	PW-14-02 5/18/2023 PW-14-02_051823	PW-14-02 8/30/2023 PW-14-02_083023
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8 UQ	< 6.8	< 7.1	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	< 7.1	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	**1.1 J**	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	< 6.8	< 8.1	< 6.8	< 6.8	< 6.8	**0.83 J**	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	< 3.4	< 4.0	< 3.4	**6.2**	**3.9**	**1.9 J**	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	**6.3**	**3.4 J**	**11**	**410**	**300**	**26**	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	< 3.4	< 3.4	**1.5 J**	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	< 3.4	< 4.0	**2.1 J**	**56**	**28**	**6.4**	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	< 3.4	**0.82 J**	< 3.4	< 3.4	< 3.4	< 3.5	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	**1.1 J**	**1.1 J**	< 3.5	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	< 3.4	**1.1 J**	**9.7**	**1200**	**1000**	**12**	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	< 3.4	< 4.0	**3.9**	**6.6**	**5.5**	**1.8 J**	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	< 3.4	**6.2**	**13**	**1500**	**1100**	**23**	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	< 3.4	< 3.4	< 3.5	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	< 3.4	< 4.0	**3.6**	**220**	**140**	**4.2**	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	**0.62 J**	< 3.4	**1.2 J**	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	< 3.4	**3.1 J**	**31**	**110**	**62**	**29**	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	< 3.4	**1.8 J**	**23**	**1600**	**1400**	**22**	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	**2.5 J**	**1.4 J**	< 3.5	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	< 3.4	**4.9**	< 3.4	**1400**	**970**	**24**	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	< 3.4	< 3.4	< 3.5	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	< 3.4	< 3.4	< 3.5	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	< 3.4	< 4.0	< 3.4	< 3.4	< 3.4	**0.57 J**	NA	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	PW-14-02 10/26/2023 PW-14-02_102623	PW-14-03R 02/17/23 PW-14-03_021723	PW-14-03R 05/20/23 PW-14-03_052023	PW-14-03R 8/30/2023 PW-14-03R_083023	PW-14-03R 11/2/2023 PW-14-03R_110223	TW-14-02 2/16/2023 TW-14-02_021623	TW-14-02 5/18/2023 TW-14-02_051823	TW-14-02 8/29/2023 TW-14-02_082923	TW-14-02 10/26/2023 TW-14-02_102623	TW-14-06 5/23/2023 TW-14-06_052323	TW-14-06 8/30/2023 TW-14-06_083023	TW-14-06 10/26/2023 TW-14-06_102623	TW-15-11 2/17/2023 TW-15-11_021723
Field Parameters																
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.08	6.80	6.80	5.46	4.89	7.52	7.69	6.61	7.61	7.50	7.46	7.27	6.76
Conductivity	- -	- -	mS/cm	2.317	3.650	3.690	3.320	3.426	4.990	4.510	4.760	4.858	2.920	1.940	0.263	2.320
Turbidity	- -	- -	NTU	28.16	9.06	35.20	254.00	100.67	38.80	52.10	7.36	6.09	NR	43.20	67.99	13.40
Dissolved oxygen (DO)	- -	- -	mg/L	8.97	6.22	7.69	7.30	7.59	12.10	8.16	0.32	10.48	11.94	10.31	11.92	0.29
Temperature	- -	- -	Deg C	18.1	4.9	12.3	15.8	14.3	2.3	21.6	18.1	16.9	16.4	17.0	16.2	8.4
Oxidation reduction potential (ORP)	- -	- -	millivolts	187.1	33.4	100.2	93.9	231.7	19.9	80.5	100.6	204.9	267.9	90.1	184.6	-11.4
Volatile Organics (via EPA Method SW5030C/8260C)																
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
1,4-Dioxane	7.2	280	µg/L	**7**	**6**	**5**	**3**	**2**	**3**	**8 [9]**	**220 Y**	< 1 UB	**4**	**5 [4]**	< 1	**17**
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	< 25 [< 25]	NA	NA	NA	NA [NA]	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA [NA]	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA [NA]	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA [NA]	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA [NA]	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	< 10 [< 10]	NA	NA	NA	NA [NA]	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	< 5 [< 5]	NA	NA	NA	NA [NA]	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	< 90 [< 90]	NA	NA	NA	NA [NA]	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA [NA]	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	< 1 [< 1]	NA	NA	NA	NA [NA]	NA	NA
Xylenes (total)	280	49	µg/L	NA	NA	NA	NA	NA	NA	< 2 [< 2]	NA	NA	NA	NA [NA]	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: Date Collected: Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	PW-14-02 10/26/2023 PW-14-02_102623	PW-14-03R 02/17/23 PW-14-03_021723	PW-14-03R 05/20/23 PW-14-03_052023	PW-14-03R 8/30/2023 PW-14-03R_083023	PW-14-03R 11/2/2023 PW-14-03R_110223	TW-14-02 2/16/2023 TW-14-02_021623	TW-14-02 5/18/2023 TW-14-02_051823	TW-14-02 8/29/2023 TW-14-02_082923	TW-14-02 10/26/2023 TW-14-02_102623	TW-14-06 5/23/2023 TW-14-06_052323	TW-14-06 8/30/2023 TW-14-06_083023	TW-14-06 10/26/2023 TW-14-06_102623	TW-15-11 2/17/2023 TW-15-11_021723
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	TW-15-11 5/20/2023 TW-15-11_052023	TW-15-11 8/30/2023 TW-15-11_083023	TW-15-11 11/2/2023 TW-15-11_110223	TW-15-12 2/16/2023 TW-15-12_021623	TW-15-12 5/17/2023 TW-15-12_051723	TW-15-12 8/30/2023 TW-15-12_083023	TW-15-12 10/26/2023 TW-15-12_102623	TWP-90-03* 10/25/23 TWP-90-03_102523	TWP-90-04* 10/25/23 TWP-90-04_102523	TWP-90-05* 10/25/23 TWP-90-05_102523	UNK-15 2/17/2023 UNK-15_021723	UNK-15 5/24/2023 UNK-15_052423	UNK-15 11/4/2023 UNK-15_110423
Field Parameters																
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.22	7.19	7.06	7.59	7.64	7.58	7.31	NR	NR	NR	7.83	7.89	7.92
Conductivity	- -	- -	mS/cm	3.540	3.330	2.745	1.820	2.470	2.160	2.763	NR	NR	NR	0.645	0.510	0.638
Turbidity	- -	- -	NTU	53.10	8.13	47.12	79.70	21.80	108.00	122.32	NR	NR	NR	1.71	1.30	3.22
Dissolved oxygen (DO)	- -	- -	mg/L	8.66	10.15	12.88	10.73	7.35	8.86	10.49	NR	NR	NR	1.32	0.36	1.67
Temperature	- -	- -	Deg C	15.5	16.8	14.0	10.1	17.5	17.0	16.2	NR	NR	NR	7.6	14.3	14.8
Oxidation reduction potential (ORP)	- -	- -	millivolts	123.1	105.2	157.4	107.8	191.9	74.8	206.8	NR	NR	NR	-145.1	59.9	85.1
Volatile Organics (via EPA Method SW5030C/8260C)																
1,1-Dichloroethane	880	740	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**47 [46]**	**120**	**108**	**1**	**3**	< 1	< 1	< 0.20*	**0.24 [0.30]***	**0.36***	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Acrylonitrile	2.6	2.0	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Styrene	100	80	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Toluene	790	270	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA
Xylenes (total)	280	49	µg/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	NA	NA	NA

See notes on last page.

Table 2
RACER Lansing - Summary of Groundwater Analytical Results - January to December 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	TW-15-11	TW-15-11	TW-15-11	TW-15-12	TW-15-12	TW-15-12	TW-15-12	TWP-90-03*	TWP-90-04*	TWP-90-05*	UNK-15	UNK-15	UNK-15
Date Collected:				5/20/2023	8/30/2023	11/2/2023	2/16/2023	5/17/2023	8/30/2023	10/26/2023	10/25/23	10/25/23	10/25/23	2/17/2023	5/24/2023	11/4/2023
Sample Name:				TW-15-11_052023	TW-15-11_083023	TW-15-11_110223	TW-15-12_021623	TW-15-12_051723	TW-15-12_083023	TW-15-12_102623	TWP-90-03_102523	TWP-90-04_102523	TWP-90-05_102523	UNK-15_021723	UNK-15_052423	UNK-15_110423
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
4:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8 UQ	< 7.3 UQ	< 6.9
6:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8 UQ	< 7.3 UQ	< 6.9
8:2 FTS	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3 UQ	< 6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
ADONA	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 6.8	< 7.3	< 6.9
Perfluorobutanesulfonic acid (PFBS)	420	670,000	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**1.6 J**	**1.2 J**	< 3.4
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**15**	**15**	**15**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**3.1 J**	**4.3**	**3.9**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**13**	**12**	**13**
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**6.3**	**6.2**	**6.3**
Perfluorohexanesulfonic acid (PFHxS)	51	210	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**16**	**15**	**16**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**11**	**9.9**	**8.7**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluorononanoic acid (PFNA)	6.0	30	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**5.0**	**5.3**	**5.2**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**1100**	**940**	**1400**
Perfluorooctanoic acid (PFOA)	8.0	170	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**30**	**26**	**24**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	**2.1 J**	< 3.4
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	**10**	**11**	**9.0**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA [NA]	NA	< 3.4	< 3.6	< 3.4

See notes on last page.

Data Flagging:

Bold font represents data where detections were noted above the laboratory method detection limit.

Gray shading represents result exceeding either or both the EGLE Part 201 Generic Cleanup Criteria and Screening Levels or the EGLE GSI Criteria (Updated December 21, 2020)

Notes:

1. EGLE Part 201 Residential Drinking Water Criteria and Groundwater Surface Water Interface Criteria from the Generic Cleanup Criteria and Screening Levels (dated January 10, 2018) are used for comparison with all VOC and Inorganic data and revised criteria values (dated October 12, 2023) are used for comparison with all PFAS data.
2. 1,4-Dioxane is compared to a drinking water criteria of 7.2 µg/L per the MDEQ Establishment of Cleanup Criteria for 1,4 -Dioxane: Emergency Rules dated October 27, 2016.
3. Duplicate analyses are presented in brackets
4. Samples were analyzed by EPA Method SM 4500PE, 4500-Norg/NH3, 522, 8260B, and Method 537 modified with isotope dilution per QSM 5.1, EGLE 28 compounds

Abbreviations:

- - = Not listed in the EGLE Criteria Tables.
* = Analyzed for low-level 1,4-Dioxane via EPA Method 522
Deg. C. = degrees Celsius
EGLE = Michigan Department of Environment, Great Lakes, and Energy
mg/L = milligrams per liter
NA = Not Analyzed
NR = Not Recorded
NTU = Nephelometric Turbidity Unit
s.u. = standard unit
µg/L = micrograms per liter
µS/cm = microSiemens per centimeter

Lab and Validation Data Qualifiers:

< = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
B = Indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).
E = Analyte exceeded calibration range. Serial dilution results not within 10%. Applicable only if analyte concentration is at least 50X the IDL in original sample.
F1 = Matrix spike and/or matrix spike duplicate recovery is outside acceptance limits.
J = The compound was positively identified, but the associated numerical value is an estimated concentration only.
O = Analysis performed by outside laboratory.
Q = Surrogate failure
S = Surrogate recovery outside of control limits
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
X = Elevated reporting limit due to matrix interference.
Y = Elevated reporting limit due to high target concentration.

Table 3
Summary of Soil Vapor Analytical Results - 2023
RACER Lansing
Lansing, Michigan

Location ID		SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)
Date		2/14/2023	2/14/2023	5/1/2023	5/1/2023	8/29/2023	8/29/2023	10/27/2023	10/27/2023
Sample ID		SVMP-20-01_021423	DUP-01_021423	SVMP_20_01_050123	DUP_01_050123	SVMP-20-01(082923)	DUP-01 (082923)	SVMP-20-01_102723	DUP-01_102723
Analyte	Residential SSVIAC (µg/m^3)								
VOC via USEPA Method TO-15 (µg/m^3)									
1,1,1-Trichloroethane	--	< 33 U	< 33 U	< 33 U	< 33 U	< 33 UV+	< 33 UV+	< 33 U	< 33 U
1,1,2,2-Tetrachloroethane	--	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U
1,1,2-Trichloroethane	--	< 6.5 U	< 6.5 U	< 6.5 U	< 6.5 U	< 6.5 U	< 6.5 U	< 6.5 U	< 6.5 U
1,1-Dichloroethane	530 ca	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U
1,1-Dichloroethene	7,000 nc	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U
1,2,4-Trichlorobenzene	--	< 89 U	< 89 U	< 89 U	< 89 U	< 22 U	< 22 U	< 22 U	< 22 U
1,2,4-Trimethylbenzene	2,100 nc	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U
1,2-Dibromoethane (Ethylene dibromide)	1.4 ca	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U
1,2-Dichlorobenzene	--	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U
1,2-Dichloroethane	33 ca	< 4.9 U	< 4.9 U	< 4.9 U	< 4.9 U	< 4.9 UV+	< 4.9 UV+	< 4.9 U	< 4.9 U
1,2-Dichloropropane	--	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U
1,3,5-Trimethylbenzene	2,100 nc	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U
1,3-Butadiene	--	< 2.7 U	< 2.7 U	< 2.7 U	< 2.7 U	< 2.7 U	< 2.7 U	< 2.7 U	< 2.7 U
1,3-Dichlorobenzene	--	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U
1,4-Dichlorobenzene	--	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U	< 36 U
1,4-Dioxane	170 ca	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U
2-Butanone (Methyl ethyl ketone) (MEK)	170,000 (SE) dev	< 35 U	< 35 U	< 35 U	< 35 U	< 35 U	< 35 U	< 35 U	< 35 U
2-Hexanone	--	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U
2-Methylnaphthalene	350 nc	< 140 U	< 140 U	< 140 U	< 140 U	Note	Note	Note	Note
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	--	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U
Acetone	1,000,000 st	< 57 U	< 57 U	< 57 U	< 57 U	< 57 U	< 57 U	< 57 U	< 57 U
Benzene	110 ca	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U
Benzyl chloride	--	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U
Bromodichloromethane	--	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U
Bromoform	--	< 62 U	< 62 U	< 62 U	< 62 U	< 62 U	< 62 U	< 62 U	< 62 U
Bromomethane (Methyl bromide)	--	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U
Carbon disulfide	24,000 nc	< 37 U	< 37 U	< 37 U	< 37 U	< 37 U	< 37 U	< 37 U	< 37 U
Carbon tetrachloride	--	< 7.5 U	< 7.5 U	< 7.5 U	< 7.5 U	< 7.5 UV+	< 7.5 UV+	< 7.5 U	< 7.5 U
Chlorobenzene	--	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U	< 28 U
Chloroethane	--	< 16 U	< 16 U	< 16 U	< 16 U	< 16 U	< 16 U	< 16 U	< 16 U
Chloroform (Trichloromethane)	37 ca	< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U
Chloromethane (Methyl chloride)	--	< 12 U	< 12 U	< 12 U	< 12 U	< 12 U	< 12 U	< 12 U	< 12 U
cis-1,2-Dichloroethene	280 nc	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U
cis-1,3-Dichloropropene	--	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U
Cyclohexane	210,000 nc	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U
Dibromochloromethane	--	< 4.1 U	< 4.1 U	< 4.1 U	< 4.1 U	< 4.1 U	< 4.1 U	< 4.1 U	< 4.1 U
Dichlorodifluoromethane (CFC-12)	--	< 30 U	< 30 U	< 30 U	< 30 U	< 30 UV+	< 30 UV+	< 30 U	< 30 U
Ethyl acetate	--	< 43 U	< 43 U	< 43 U	< 43 U	< 43 U	< 43 U	< 43 U	< 43 U
Ethylbenzene	340 ca	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U
Hexachlorobutadiene	--	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U
Hexane	24,000 nc	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U
Isopropyl alcohol	--	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U	< 29 U
m&p-Xylene	--	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U
Methyl tert butyl ether (MTBE)	3,300 ca	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U	< 22 U
Methylene chloride	--	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U
Naphthalene	25 ca	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U	< 19 U
N-Heptane	--	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U	< 49 U
o-Xylene	--	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U	< 52 U
Styrene	--	< 51 U	< 51 U	< 51 U	< 51 U	< 51 U	< 51 U	< 51 U	< 51 U
Tetrachloroethene	1,400 (SE) st	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U	< 41 U
Tetrahydrofuran	--	< 3.5 U	< 3.5 U	**6.3**	**5.3**	< 3.5 U	< 3.5 U	< 3.5 U	< 3.5 U

Table 3
Summary of Soil Vapor Analytical Results - 2023
RACER Lansing
Lansing, Michigan

	Location ID	SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)	SVMP-20-01	SVMP-20-01 (Dup)
	Date	2/14/2023	2/14/2023	5/1/2023	5/1/2023	8/29/2023	8/29/2023	10/27/2023	10/27/2023
	Sample ID	SVMP-20-01_021423	DUP-01_021423	SVMP_20_01_050123	DUP_01_050123	SVMP-20-01(082923)	DUP-01 (082923)	SVMP-20-01_102723	DUP-01_102723
Analyte	Residential SSVIAC (µg/m^3)								
VOC via USEPA Method TO-15 (µg/m^3)									
Toluene	170,000 (SE) st	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U	< 23 U
trans-1,2-Dichloroethene	2,800 nc	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U	< 24 U
trans-1,3-Dichloropropene	--	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U	< 27 U
Trichloroethene	67 (SE) dev	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	**5.7**	**3.3**	< 1.6 U	< 1.6 U
Trichlorofluoromethane (CFC-11)	--	< 34 U	< 34 U	< 34 U	< 34 U	< 34 UV+	< 34 UV+	< 34 U	< 34 U
Trifluorotrichloroethane (Freon 113)	--	< 46 U	< 46 U	< 46 U	< 46 U	< 46 U	< 46 U	< 46 U	< 46 U
Vinyl acetate	--	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U	< 42 U
Vinyl chloride	54 ca	< 15 U	< 15 U	< 15 U	< 15 U	< 15 U	< 15 U	< 15 U	< 15 U
Xylene (total)	7,600 nc	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U	< 100 U

NOTES:
Note = Beginning August 14, 2023, Metiri (lab) will be removing 2-methylnaphthalene from the TO-15 analysis. This is due to a combination of increased challenges with retaining a suitable vendor for the laboratory standards and also recent changes in instrumentation.
All results compared to Michigan Department of Environment, Great Lakes and Energy (EGLE) site-specific volatilization to indoor air criteria (SSVIAC), August 15, 2018.
Residential SSVIAC - Applies to a residential house with a basement, the depth to groundwater of 10 feet at the Site and soil type of sand.
Bolded values were detected above laboratory detection limits
Dup - represents duplicate sample analytical results
NA - not analyzed for respective constituent
All analytical results are presented in micrograms per cubic meter (µg/m^3)
-- = No criteria requested for SSVIAC
< = Not Detected above laboratory detection limit
SVMP = Soil vapor monitoring point
SSVIAC = Site-specific volatilization to indoor air criteria (provided by EGLE)
U = The analyte was not detected at or above the reporting limit
V+ = Recovery in the associated continuing calibration verification sample (CCV) exceeds the upper control limit. Results may be biased high.

EGLE Footnotes:
(SE) = Site-specific criteria based on single event exposure; therefore, sampling methods should reflect shorter exposure scenarios.
ca = the criterion is based on carcinogenic health effects
dev = the criterion is based on developmental health effects
nc = the criterion is based on non-carcinogenic health effects
st = the criterion is based on short-term toxicity

Table 4
Summary of LNAPL Thickness - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Depth to Water (feet below TOC)	Depth to LNAPL (feet below TOC)	Calculated Thickness NAPL (feet)	Groundwater Elevation (feet msl)	Corrected Groundwater Elevation (feet msl)
Plant 2									
LMW-12-01	5/16/2023	864.91	862.14	NM	5.09	NP	NP	859.82	859.82
LMW-12-01	10/24/2023	864.91	862.14	NM	4.22	NP	NP	860.69	860.69
LMW-12-02	5/16/2023	865.25	862.17	NM	4.99	NP	NP	860.26	860.26
LMW-12-02	10/24/2023	865.25	862.17	NM	4.44	NP	NP	860.81	860.81
LMW-12-03D	5/16/2023	864.99	862.08	NM	19.52	3.50	16.02	845.47	859.88
LMW-12-03D	10/24/2023	864.99	862.08	NM	16.14	3.04	13.10	848.85	860.63
LMW-12-03S	5/16/2023	864.93	862.06	NM	4.02	3.99	0.03	860.91	860.94
LMW-12-03S	10/24/2023	864.93	862.06	NM	3.80	3.62	0.18	861.13	861.29
LMW-12-04	5/16/2023	864.94	862.12	NM	5.61	NP	NP	859.33	859.33
LMW-12-04	10/24/2023	864.94	862.12	NM	5.32	NP	NP	859.62	859.62
LMW-12-05	5/16/2023	865.03	862.17	NM	6.70	5.94	0.76	858.33	859.01
LMW-12-05	10/24/2023	865.03	862.17	NM	6.30	5.45	0.85	858.73	859.49
LMW-12-06	5/16/2023	865.02	862.15	NM	6.22	NP	NP	858.80	858.80
LMW-12-06	10/24/2023	865.02	862.15	NM	5.89	NP	NP	859.13	859.13
LMW-12-07	5/16/2023	864.13	861.50	NM	2.87	NP	NP	861.26	861.26
LMW-12-07	10/24/2023	864.13	861.50	NM	2.56	NP	NP	861.57	861.57
LMW-12-08	5/16/2023	864.40	861.56	NM	4.65	3.22	1.43	859.75	861.04
LMW-12-08	10/24/2023	864.40	861.56	NM	4.38	2.71	1.67	860.02	861.52
LMW-14-12D	5/16/2023	864.59	862.11	25.00	24.99	3.58	21.41	839.60	858.86
LMW-14-12D	10/24/2023	864.59	862.11	NM	25.00	3.02	21.98	839.59	859.36
LMW-14-13D	5/16/2023	865.03	862.06	NM	4.84	NP	NP	860.19	860.19
LMW-14-13D	10/24/2023	865.03	862.06	NM	4.44	NP	NP	860.59	860.59
LMW-14-14D	5/16/2023	864.89	861.90	NM	7.33	NP	NP	857.56	857.56
LMW-14-14D	10/24/2023	864.89	861.90	NM	6.59	NP	NP	858.30	858.30
LMW-14-15D	5/16/2023	865.11	861.66	22.65	22.64	3.99	18.65	842.47	859.25
LMW-14-15D	10/24/2023	865.11	861.66	NM	21.03	3.59	17.44	844.08	859.77
LMW-15-16D	5/16/2023	865.20	862.24	NM	23.65	5.39	18.26	841.55	857.97
LMW-15-16D	10/24/2023	865.20	862.24	NM	21.91	4.35	17.56	843.29	859.09
LMW-15-17D	5/16/2023	865.21	862.24	NM	5.79	NP	NP	859.42	859.42
LMW-15-17D	10/24/2023	865.21	862.24	NM	5.49	NP	NP	859.72	859.72
P2-SB-37	5/16/2023	865.90	861.90	NM	5.20	3.85	1.35	860.70	861.91
P2-SB-37	10/24/2023	865.90	861.90	NM	6.48	5.17	1.31	859.42	860.60
PMW-01	5/16/2023	860.85	861.33	NM	0.04	0.01	0.03	860.81	860.83
PMW-01	10/24/2023	860.85	861.33	NM	NM	NP	NP	NM	NM
PMW-02	5/16/2023	860.94	861.33	NM	0.02	0.01	0.01	860.92	860.93
PMW-02	10/24/2023	860.94	861.33	NM	NM	NP	NP	NM	NM
PMW-03	5/16/2023	861.59	862.12	NM	0.29	NP	NP	861.30	861.30
PMW-03	10/24/2023	861.59	862.12	NM	0.23	NP	NP	861.36	861.36
Plant 3									
LMW-12-09	5/16/2023	863.22	860.40	NM	3.69	3.59	0.10	859.53	859.62
LMW-12-09	10/24/2023	863.22	860.40	NM	3.32	3.29	0.03	859.90	859.93
LMW-12-10	5/16/2023	866.82	863.60	NM	18.40	11.34	7.06	848.42	854.77
LMW-12-10	10/24/2023	866.82	863.60	NM	15.92	10.85	5.07	850.90	855.46
LMW-12-11	5/16/2023	866.53	863.53	NM	11.14	NP	NP	855.39	855.39
LMW-12-11	10/24/2023	866.53	863.53	NM	11.99	NP	NP	854.54	854.54

Notes:
1. Where LNAPL was observed, groundwater elevations have been corrected using a measured LNAPL density of 0.8995 gram per milliliter.
2. PMW-01 and PMW-02 could not be gauged on 10/24/2023 as planned due to the flushmounts being under standing water.

Abbreviations:
LNAPL = light nonaqueous phase liquid
msl = mean sea level
NAPL = nonaqueous phase liquid
NM = not measured
NP = no product
TOC = top of casing
RACER = Revitalizing Auto Communities Environmental Response

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
LMW-12-01	5/16/2023	7.0	12.0	864.91	862.14	NM	5.09	859.82
LMW-12-01	10/24/2023	7.0	12.0	864.91	862.14	NM	4.22	860.69
LMW-12-02	5/16/2023	5.0	10.0	865.25	862.17	NM	4.99	860.26
LMW-12-02	10/24/2023	5.0	10.0	865.25	862.17	NM	4.44	860.81
LMW-12-03D	5/16/2023	17.3	22.3	864.99	862.08	NM	5.11	859.88*
LMW-12-03D	10/24/2023	17.3	22.3	864.99	862.08	NM	4.36	860.63*
LMW-12-03S	5/16/2023	4.0	9.0	864.93	862.06	NM	3.99	860.94*
LMW-12-03S	10/24/2023	4.0	9.0	864.93	862.06	NM	3.64	861.29*
LMW-12-04	5/16/2023	16.0	21.0	864.94	862.12	NM	5.61	859.33
LMW-12-04	10/24/2023	16.0	21.0	864.94	862.12	NM	5.32	859.62
LMW-12-05	5/16/2023	7.0	12.0	865.03	862.17	NM	6.02	859.01*
LMW-12-05	10/24/2023	7.0	12.0	865.03	862.17	NM	5.54	859.49*
LMW-12-06	5/16/2023	4.0	9.0	865.02	862.15	NM	6.22	858.80
LMW-12-06	10/24/2023	4.0	9.0	865.02	862.15	NM	5.89	859.13
LMW-12-07	5/16/2023	4.0	9.0	864.13	861.50	NM	2.87	861.26
LMW-12-07	10/24/2023	4.0	9.0	864.13	861.50	NM	2.56	861.57
LMW-12-08	5/16/2023	8.0	13.0	864.40	861.56	NM	3.36	861.04*
LMW-12-08	10/24/2023	8.0	13.0	864.40	861.56	NM	2.88	861.52*
LMW-14-12D	5/16/2023	18.0	23.0	864.59	862.11	25.00	5.73	858.86*
LMW-14-12D	10/24/2023	18.0	23.0	864.59	862.11	NM	5.23	859.36*
LMW-14-13D	5/16/2023	17.5	22.5	865.03	862.06	NM	4.84	860.19
LMW-14-13D	10/24/2023	17.5	22.5	865.03	862.06	NM	4.44	860.59
LMW-14-14D	5/16/2023	18.0	23.0	864.89	861.90	NM	7.33	857.56
LMW-14-14D	10/24/2023	18.0	23.0	864.89	861.90	NM	6.59	858.30
LMW-14-15D	5/16/2023	18.0	23.0	865.11	861.66	22.65	5.86	859.25*
LMW-14-15D	10/24/2023	18.0	23.0	865.11	861.66	NM	5.34	859.77*
LMW-15-16D	5/16/2023	19.5	24.5	865.20	862.24	NM	7.23	857.97*
LMW-15-16D	10/24/2023	19.5	24.5	865.20	862.24	NM	6.11	859.09*
LMW-15-17D	5/16/2023	20.0	25.0	865.21	862.24	NM	5.79	859.42
LMW-15-17D	10/24/2023	20.0	25.0	865.21	862.24	NM	5.49	859.72
MW-01(2)	5/16/2023	10.0	20.0	875.79	876.10	15.97	7.49	868.30
MW-01(2)	10/23/2023	10.0	20.0	875.79	876.10	15.98	9.80	865.99
MW-12-01	5/16/2023	87.0	110.0	867.94	865.46	114.47	78.02	789.92
MW-12-01	10/23/2023	87.0	110.0	867.94	865.46	111.05	80.42	787.52
MW-12-02	10/23/2023	87.0	110.0	853.91	851.88	108.94	69.04	784.87
MW-12-05R	5/16/2023	100.0	112.0	861.80	862.30	107.22	72.72	789.08
MW-12-05R	10/24/2023	100.0	112.0	861.80	862.30	112.30	75.23	786.57
MW-12-06	5/16/2023	80.6	99.5	864.64	861.69	107.45	72.60	792.04
MW-12-06	10/24/2023	80.6	99.5	864.64	861.69	103.57	74.66	789.98
MW-12-07	5/16/2023	10.0	15.0	872.11	869.21	17.71	7.96	864.15
MW-12-07	10/23/2023	10.0	15.0	872.11	869.21	17.22	9.45	862.66
MW-12-08	5/16/2023	19.0	24.0	864.68	861.50	27.08	3.41	861.27
MW-12-08	10/23/2023	19.0	24.0	864.68	861.50	27.15	3.41	861.27
MW-12-09	5/16/2023	14.0	19.0	863.54	860.63	NM	12.19	851.35
MW-12-09	10/23/2023	14.0	19.0	863.54	860.63	21.59	12.10	851.44
MW-12-18	5/15/2023	28.0	33.0	866.43	864.19	34.78	12.87	853.56
MW-12-18	10/23/2023	28.0	33.0	866.43	864.19	34.82	22.89	843.54
MW-13-43	5/15/2023	72.0	77.0	863.82	860.97	77.70	64.40	799.42
MW-13-43	10/24/2023	72.0	77.0	863.82	860.97	77.50	68.52	795.30
MW-13-44	5/16/2023	96.0	115.0	864.24	861.03	123.21	76.66	787.58

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-13-44	10/24/2023	96.0	115.0	864.24	861.03	119.05	79.25	784.99
MW-13-45	5/15/2023	72.0	77.0	863.80	861.54	78.32	65.15	798.65
MW-13-45	10/23/2023	72.0	77.0	863.80	861.54	78.30	66.01	797.79
MW-13-51	5/16/2023	77.0	87.0	875.34	872.51	89.85	72.11	803.23
MW-14-54	5/15/2023	14.0	19.0	865.21	862.21	19.02	8.61	856.60
MW-14-54	10/23/2023	14.0	19.0	865.21	862.21	19.03	7.77	857.44
MW-14-55	5/15/2023	13.0	18.0	864.17	861.73	20.07	14.41	849.76
MW-14-55	10/23/2023	13.0	18.0	864.17	861.73	20.08	15.86	848.31
MW-14-56	5/16/2023	71.0	76.0	860.21	860.62	75.65	65.05	795.16
MW-14-56	10/23/2023	71.0	76.0	860.21	860.62	76.48	66.01	794.20
MW-14-57	5/15/2023	15.0	20.0	863.97	861.10	21.35	10.29	853.68
MW-14-57	10/23/2023	15.0	20.0	863.97	861.10	21.36	9.72	854.25
MW-14-58R	5/15/2023	22.0	27.0	862.93	860.09	15.35	12.93	850.00
MW-14-58R	10/23/2023	22.0	27.0	862.93	860.09	29.58	12.76	850.17
MW-14-59	5/15/2023	12.0	17.0	865.13	861.63	NM	5.72	859.41
MW-14-59	10/23/2023	12.0	17.0	865.13	861.63	19.33	4.63	860.50
MW-14-60	5/15/2023	15.0	20.0	864.65	861.70	22.42	9.70	854.95
MW-14-60	10/23/2023	15.0	20.0	864.65	861.70	22.45	8.37	856.28
MW-14-61	5/15/2023	70.0	75.0	865.51	862.30	77.42	66.40	799.11
MW-14-61	10/24/2023	70.0	75.0	865.51	862.30	77.42	68.37	797.14
MW-14-62	5/18/2023	12.0	17.0	865.17	862.25	19.65	4.01	861.16
MW-14-62	10/23/2023	12.0	17.0	865.17	862.25	19.64	3.56	861.61
MW-14-63	5/16/2023	68.0	73.0	854.64	851.68	76.71	65.78	788.86
MW-14-63	10/23/2023	68.0	73.0	854.64	851.68	76.70	68.63	786.01
MW-15-72	5/16/2023	63.0	68.0	865.09	862.35	70.27	56.24	808.85
MW-15-72	10/24/2023	63.0	68.0	865.09	862.35	70.26	57.21	807.88
MW-15-73	5/16/2023	78.0	83.0	861.56	859.12	80.97	71.76	789.80
MW-15-73	10/23/2023	78.0	83.0	861.56	859.12	80.95	73.70	787.86
MW-16-74	5/15/2023	66.0	71.0	864.81	862.10	73.68	65.15	799.66
MW-16-74	10/24/2023	66.0	71.0	864.81	862.10	73.65	67.41	797.40
MW-16-75	5/15/2023	66.0	71.0	864.87	862.13	74.45	62.11	802.76
MW-16-75	10/23/2023	66.0	71.0	864.87	862.13	74.05	62.20	802.67
MW-16-76	5/16/2023	70.0	75.0	867.76	865.12	82.66	65.45	802.31
MW-16-76	10/23/2023	70.0	75.0	867.76	865.12	82.07	66.35	801.41
MW-16-77	5/16/2023	66.0	71.0	866.17	863.42	73.98	60.87	805.30
MW-16-77	10/23/2023	66.0	71.0	866.17	863.42	73.97	61.80	804.37
MW-16-78	5/15/2023	68.0	73.0	864.98	862.09	76.71	64.73	800.25
MW-16-78	10/23/2023	68.0	73.0	864.98	862.09	76.70	65.11	799.87
MW-16-80	5/16/2023	68.0	73.0	853.03	853.41	73.31	64.05	788.98
MW-16-80	10/23/2023	68.0	73.0	853.03	853.41	73.35	66.00	787.03
MW-16-81	5/15/2023	70.0	75.0	864.68	862.04	77.21	65.08	799.60
MW-16-81	10/24/2023	70.0	75.0	864.68	862.04	77.24	63.40	801.28
MW-16-82	5/16/2023	70.0	75.0	864.79	862.10	77.40	65.85	798.94
MW-16-82	10/24/2023	70.0	75.0	864.79	862.10	77.14	67.76	797.03
MW-16-83	5/16/2023	71.0	76.0	862.97	860.17	79.08	72.61	790.36
MW-16-83	10/23/2023	71.0	76.0	862.97	860.17	79.06	74.46	788.51
MW-16-84	5/15/2023	72.0	77.0	864.09	861.81	81.15	69.25	794.84
MW-16-84	10/24/2023	72.0	77.0	864.09	861.81	81.15	70.32	793.77
MW-16-85	5/15/2023	74.0	79.0	864.77	861.87	81.84	70.57	794.20
MW-16-85	10/23/2023	74.0	79.0	864.77	861.87	81.83	71.75	793.02

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-17-86	5/15/2023	73.0	78.0	864.55	861.92	81.42	65.55	799.00
MW-17-86	10/24/2023	73.0	78.0	864.55	861.92	81.44	67.35	797.20
MW-17-87	5/16/2023	100.0	112.0	862.82	860.44	113.69	75.15	787.67
MW-17-87	10/23/2023	100.0	112.0	862.82	860.44	113.78	77.05	785.77
MW-19-115	5/16/2023	72.5	77.5	865.04	862.19	80.35	58.15	806.89
MW-19-115	10/23/2023	72.5	77.5	865.04	862.19	80.69	59.01	806.03
MW-19-116	5/16/2023	65.0	70.0	865.12	862.17	73.19	55.96	809.16
MW-19-116	10/24/2023	65.0	70.0	865.12	862.17	73.19	56.75	808.37
MW-19-117	5/16/2023	54.0	59.0	865.10	862.15	62.81	58.91	806.19
MW-19-117	10/24/2023	54.0	59.0	865.10	862.15	62.85	59.47	805.63
MW-19-118D	5/16/2023	175.0	190.0	862.78	859.80	195.54	76.03	786.75
MW-19-118D	10/23/2023	175.0	190.0	862.78	859.80	192.98	78.60	784.18
MW-19-118S	5/16/2023	145.0	160.0	862.81	859.80	164.84	76.02	786.79
MW-19-118S	10/23/2023	145.0	160.0	862.81	859.80	162.90	78.59	784.22
MW-19-120	5/15/2023	66.0	71.0	864.73	862.13	73.99	65.79	798.94
MW-19-120	10/24/2023	66.0	71.0	864.73	862.13	74.00	67.46	797.27
MW-19-121	5/15/2023	66.0	71.0	864.55	862.19	73.50	64.16	800.39
MW-19-121	10/24/2023	66.0	71.0	864.55	862.19	73.60	67.21	797.34
MW-19-122	5/15/2023	59.0	64.0	865.02	862.15	67.45	63.20	801.82
MW-19-122	10/24/2023	59.0	64.0	865.02	862.15	66.90	64.20	800.82
MW-19-123	5/15/2023	66.0	71.0	864.45	862.04	74.48	70.92	793.53
MW-19-123	10/24/2023	66.0	71.0	864.45	862.04	73.82	65.35	799.10
MW-19-124	5/15/2023	65.0	70.0	864.53	862.22	72.30	64.79	799.74
MW-19-124	10/24/2023	65.0	70.0	864.53	862.22	72.20	67.05	797.48
MW-19-125	5/16/2023	100.0	115.0	865.11	862.11	106.50	77.71	787.40
MW-19-125	10/24/2023	100.0	115.0	865.11	862.11	109.01	78.46	786.65
MW-20-126	5/16/2023	69.0	74.0	861.89	859.50	76.00	57.75	804.14
MW-20-126	10/24/2023	69.0	74.0	861.89	859.50	NM	72.42	789.47
MW-20-127	5/16/2023	72.0	77.0	862.58	861.30	78.70	65.31	797.27
MW-20-127	10/24/2023	72.0	77.0	862.58	861.30	NM	68.11	794.47
MW-20-128	5/15/2023	65.0	70.0	863.73	861.40	69.72	66.92	796.81
MW-20-128	10/24/2023	65.0	70.0	863.73	861.40	70.45	66.90	796.83
MW-20-129	5/16/2023	64.0	69.0	864.91	862.20	70.98	60.26	804.65
MW-20-129	10/24/2023	64.0	69.0	864.91	862.20	71.70	61.48	803.43
MW-20-130	5/15/2023	63.0	68.0	863.98	862.20	69.97	66.89	797.09
MW-20-130	10/23/2023	63.0	68.0	863.98	862.20	70.30	67.81	796.17
MW-21-139	5/15/2023	7.0	12.0	865.00	862.17	15.35	3.09	861.91
MW-21-139	10/23/2023	7.0	12.0	865.00	862.17	15.36	3.05	861.95
MW-21-140	5/15/2023	67.0	72.0	866.06	862.76	75.95	68.37	797.69
MW-21-140	10/23/2023	67.0	72.0	866.06	862.76	76.00	69.09	796.97
MW-21-142	5/16/2023	71.5	76.5	853.70	850.79	79.16	64.70	789.00
MW-21-142	10/23/2023	71.5	76.5	853.70	850.79	78.81	67.70	786.00
MW-22-153	5/15/2023	25.0	30.0	860.43	859.44	31.18	10.41	850.02
MW-22-153	10/23/2023	25.0	30.0	860.43	859.44	31.18	10.25	850.18
MW-22-155	5/15/2023	25.5	30.5	861.58	858.99	31.50	11.69	849.89
MW-22-155	10/23/2023	25.5	30.5	861.58	858.99	31.49	11.54	850.04
MW-22-156	5/15/2023	23.0	28.0	863.07	860.13	31.60	12.90	850.17
MW-22-156	10/23/2023	23.0	28.0	863.07	860.13	31.04	12.69	850.38
MW-22-157	5/15/2023	24.0	29.0	852.38	853.06	27.63	2.38	850.00
MW-22-157	10/23/2023	24.0	29.0	852.38	853.06	27.61	2.28	850.10

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-23-161	10/23/2023	20.0	25.0	858.48	856.00	27.58	10.57	847.91
MW-23-162	10/23/2023	29.0	34.0	861.95	859.41	36.58	14.20	847.75
MW-23-163	10/23/2023	20.0	25.0	862.61	860.31	27.21	13.54	849.07
P2-MW-02	5/15/2023	31.0	41.0	872.24	872.70	40.22	36.32	835.92
P2-MW-02	10/23/2023	31.0	41.0	872.24	872.70	40.22	36.22	836.02
P2-MW-03	5/15/2023	27.0	32.0	854.18	854.66	27.18	8.49	845.69
P2-MW-03	10/23/2023	27.0	32.0	854.18	854.66	27.18	8.41	845.77
P2-MW-04	5/15/2023	26.0	36.0	866.12	862.75	39.60	11.92	854.20
P2-MW-04	10/23/2023	26.0	36.0	866.12	862.75	39.64	10.75	855.37
P2-SB-03	5/15/2023	14.0	19.0	863.89	861.03	22.10	14.11	849.78
P2-SB-03	10/23/2023	14.0	19.0	863.89	861.03	22.11	13.31	850.58
P2-SB-06	5/15/2023	24.0	29.0	866.06	862.09	33.58	16.02	850.04
P2-SB-06	10/23/2023	24.0	29.0	866.06	862.09	33.60	15.02	851.04
P2-SB-20	5/15/2023	8.0	13.0	864.46	861.12	16.28	9.47	854.99
P2-SB-20	10/23/2023	8.0	13.0	864.46	861.12	16.29	8.20	856.26
P2-SB-37	5/16/2023	5.0	10.0	865.90	861.90	NM	3.99	861.91*
P2-SB-37	10/24/2023	5.0	10.0	865.90	861.90	NM	5.30	860.6*
PMW-01	5/16/2023	2.6	7.6	860.85	861.33	NM	0.01	860.83*
PMW-01	10/24/2023	2.6	7.6	860.85	861.33	NM	NM	NM
PMW-02	5/16/2023	2.6	7.6	860.94	861.33	NM	0.01	860.93*
PMW-02	10/24/2023	2.6	7.6	860.94	861.33	NM	NM	NM
PMW-03	5/16/2023	1.2	6.2	861.59	862.12	NM	0.29	861.30
PMW-03	10/24/2023	1.2	6.2	861.59	862.12	NM	0.23	861.36
PW-14-01	5/15/2023	71.6	76.8	864.97	862.38	86.00	65.25	799.72
PW-14-01	10/24/2023	71.6	76.8	864.97	862.38	NM	69.63	795.34
PW-14-02	5/15/2023	75.0	80.0	863.87	860.93	88.00	64.85	799.02
PW-14-02	10/24/2023	75.0	80.0	863.87	860.93	NM	67.81	796.06
TW-14-02	5/15/2023	67.0	72.0	865.01	862.13	71.60	61.51	803.50
TW-14-02	10/24/2023	67.0	72.0	865.01	862.13	NM	63.22	801.79
TW-15-12	5/15/2023	73.0	78.0	860.88	861.23	66.36	62.40	798.48
TW-15-12	10/24/2023	73.0	78.0	860.88	861.23	76.80	66.48	794.40
CH-14-RO	5/15/2023	7.0	12.0	866.47	863.74	NM	7.61	858.86
CH-14-RO	10/23/2023	7.0	12.0	866.47	863.74	NM	6.61	859.86
LMW-12-09	5/16/2023	3.0	8.0	863.22	860.40	NM	3.60	859.62*
LMW-12-09	10/24/2023	3.0	8.0	863.22	860.40	NM	3.29	859.93*
LMW-12-10	5/16/2023	14.0	19.0	866.82	863.60	NM	12.05	854.77*
LMW-12-10	10/24/2023	14.0	19.0	866.82	863.60	NM	11.36	855.46*
LMW-12-11	5/16/2023	15.0	20.0	866.53	863.53	NM	11.14	855.39
LMW-12-11	10/24/2023	15.0	20.0	866.53	863.53	NM	11.99	854.54
MW-02-01(3)	5/15/2023	59.0	69.0	865.54	863.35	72.10	50.81	814.73
MW-02-01(3)	10/23/2023	59.0	69.0	865.54	863.35	72.15	50.93	814.61
MW-02-02(3)	5/15/2023	74.0	84.0	862.70	863.11	83.70	60.74	801.96
MW-02-02(3)	10/23/2023	74.0	84.0	862.70	863.11	83.70	62.21	800.49
MW-02-03(3)	5/15/2023	79.0	89.0	859.63	859.90	89.10	59.21	800.42
MW-02-03(3)	10/23/2023	79.0	89.0	859.63	859.90	89.10	60.99	798.64
MW-02-04(3)	5/15/2023	76.0	86.0	859.41	859.96	NM	59.35	800.06
MW-02-04(3)	10/23/2023	76.0	86.0	859.41	859.96	NM	61.73	797.68
MW-04-02(3)	5/16/2023	126.0	136.0	861.09	861.26	133.30	61.86	799.23
MW-04-02(3)	10/23/2023	126.0	136.0	861.09	861.26	133.25	64.40	796.69
MW-04-03(3)	5/16/2023	80.0	90.0	860.72	861.00	87.30	60.86	799.86

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-04-03(3)	10/23/2023	80.0	90.0	860.72	861.00	87.30	63.15	797.57
MW-04-04(3)	5/15/2023	72.0	82.0	855.72	856.11	81.60	55.81	799.91
MW-04-04(3)	10/23/2023	72.0	82.0	855.72	856.11	81.60	57.80	797.92
MW-05(3)	5/15/2023	10.0	15.0	863.44	859.80	19.50	4.48	858.96
MW-05(3)	10/23/2023	10.0	15.0	863.44	859.80	19.50	4.24	859.20
MW-12-04	5/15/2023	77.0	100.0	844.08	844.26	100.25	46.68	797.40
MW-12-04	10/23/2023	77.0	100.0	844.08	844.26	100.25	49.85	794.23
MW-12-20	5/16/2023	75.0	80.0	864.20	861.45	79.45	64.67	799.53
MW-12-20	10/23/2023	75.0	80.0	864.20	861.45	79.45	67.02	797.18
MW-12-21	5/16/2023	70.0	75.0	864.50	861.45	78.10	64.21	800.29
MW-12-21	10/24/2023	70.0	75.0	864.50	861.45	78.10	66.11	798.39
MW-13-22	5/16/2023	89.0	94.0	864.37	861.50	96.15	67.23	797.14
MW-13-22	10/24/2023	89.0	94.0	864.37	861.50	96.15	70.19	794.18
MW-13-23	5/16/2023	69.0	74.0	864.31	861.45	77.50	64.55	799.76
MW-13-23	10/24/2023	69.0	74.0	864.31	861.45	77.50	67.19	797.12
MW-13-24	5/16/2023	69.0	74.0	864.35	861.48	77.30	63.58	800.77
MW-13-24	10/24/2023	69.0	74.0	864.35	861.48	77.30	65.79	798.56
MW-13-25	5/16/2023	67.0	72.0	863.77	860.49	75.00	64.33	799.44
MW-13-25	10/24/2023	67.0	72.0	863.77	860.49	75.00	65.06	798.71
MW-13-26	5/16/2023	72.0	77.0	863.95	861.67	79.20	63.39	800.56
MW-13-26	10/23/2023	72.0	77.0	863.95	861.67	79.20	65.69	798.26
MW-13-27	5/16/2023	67.0	72.0	864.50	861.54	75.70	64.71	799.79
MW-13-27	10/24/2023	67.0	72.0	864.50	861.54	75.70	65.54	798.96
MW-13-28	5/16/2023	99.0	115.5	864.42	861.61	114.75	67.89	796.53
MW-13-28	10/24/2023	99.0	115.5	864.42	861.61	114.75	71.58	792.84
MW-13-29	5/16/2023	68.0	73.0	862.81	859.81	76.30	33.80	829.01
MW-13-29	10/24/2023	68.0	73.0	862.81	859.81	76.30	63.22	799.59
MW-13-30	5/16/2023	72.0	77.0	864.53	861.66	79.80	65.21	799.32
MW-13-30	10/23/2023	72.0	77.0	864.53	861.66	79.80	67.49	797.04
MW-13-31	5/15/2023	5.0	10.0	861.27	858.36	12.80	7.48	853.79
MW-13-31	10/23/2023	5.0	10.0	861.27	858.36	12.80	9.21	852.06
MW-13-32	5/15/2023	5.0	10.0	860.11	857.32	12.65	6.28	853.83
MW-13-32	10/23/2023	5.0	10.0	860.11	857.32	12.65	7.90	852.21
MW-13-34	5/15/2023	74.0	79.0	853.92	851.82	79.90	64.18	789.74
MW-13-34	10/24/2023	74.0	79.0	853.92	851.82	79.90	66.42	787.50
MW-13-37	5/15/2023	97.0	112.0	866.02	863.75	114.35	68.05	797.97
MW-13-37	10/23/2023	97.0	112.0	866.02	863.75	114.35	70.19	795.83
MW-13-38	5/15/2023	107.0	124.0	866.47	863.71	126.50	68.69	797.78
MW-13-38	10/23/2023	107.0	124.0	866.47	863.71	126.50	70.75	795.72
MW-13-39B	5/15/2023	97.0	112.0	860.20	857.33	105.50	62.11	798.09
MW-13-39B	10/23/2023	97.0	112.0	860.20	857.33	105.50	63.84	796.36
MW-13-40	5/15/2023	72.0	77.0	862.95	859.74	78.90	55.52	807.43
MW-13-40	10/23/2023	72.0	77.0	862.95	859.74	78.90	56.82	806.13
MW-13-41	5/15/2023	77.0	82.0	863.41	863.68	81.50	54.75	808.66
MW-13-41	10/23/2023	77.0	82.0	863.41	863.68	81.55	55.82	807.59
MW-13-46	5/15/2023	68.0	73.0	854.54	852.12	74.65	62.82	791.72
MW-13-46	10/24/2023	68.0	73.0	854.54	852.12	74.65	63.61	790.93
MW-13-47	5/15/2023	99.0	119.0	853.74	851.89	113.65	63.52	790.22
MW-13-47	10/24/2023	99.0	119.0	853.74	851.89	113.65	65.85	787.89
MW-13-48	5/15/2023	65.0	70.0	854.83	852.17	73.25	55.89	798.94

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-13-48	10/24/2023	65.0	70.0	854.83	852.17	73.25	56.19	798.64
MW-13-49	5/15/2023	73.0	78.0	853.01	850.55	81.65	63.77	789.24
MW-14-64	5/16/2023	98.6	103.6	864.56	861.77	106.30	67.98	796.58
MW-14-64	10/24/2023	98.6	103.6	864.56	861.77	106.30	70.43	794.13
MW-14-65	5/15/2023	5.0	10.0	866.34	863.71	NM	6.95	859.39
MW-14-65	10/23/2023	5.0	10.0	866.34	863.71	13.20	6.35	859.99
MW-15-71	5/16/2023	110.0	115.0	864.07	861.71	119.10	64.62	799.45
MW-15-71	10/23/2023	110.0	115.0	864.07	861.71	119.10	66.97	797.10
MW-18-88	5/15/2023	6.0	11.0	863.70	860.93	NM	5.16	858.54
MW-18-88	10/23/2023	6.0	11.0	863.70	860.93	NM	4.39	859.31
MW-18-89	5/15/2023	7.0	12.0	866.53	863.51	NM	7.26	859.27
MW-18-89	10/23/2023	7.0	12.0	866.53	863.51	NM	5.09	861.44
MW-18-90	5/15/2023	15.0	20.0	866.32	863.25	NM	9.51	856.81
MW-18-90	10/23/2023	15.0	20.0	866.32	863.25	NM	9.59	856.73
MW-18-91	5/15/2023	7.0	12.0	865.94	863.43	NM	6.11	859.83
MW-18-91	10/23/2023	7.0	12.0	865.94	863.43	NM	5.37	860.57
MW-18-92	5/16/2023	23.0	28.0	870.43	869.08	NM	14.82	855.61
MW-18-92	10/23/2023	23.0	28.0	870.43	869.08	NM	20.15	850.28
MW-18-93	5/15/2023	77.5	82.5	863.77	860.99	NM	48.22	815.55
MW-18-93	10/23/2023	77.5	82.5	863.77	860.99	NM	48.25	815.52
MW-18-94	5/15/2023	72.0	77.0	866.34	863.86	NM	53.05	813.29
MW-18-94	10/23/2023	72.0	77.0	866.34	863.86	NM	53.43	812.91
MW-18-95	5/15/2023	4.5	9.5	864.66	861.76	NM	6.83	857.83
MW-18-95	10/23/2023	4.5	9.5	864.66	861.76	NM	6.46	858.20
MW-18-96	5/16/2023	7.0	12.0	864.60	861.64	NM	DRY	DRY
MW-18-96	10/23/2023	7.0	12.0	864.60	861.64	14.85	DRY	DRY
MW-18-97	5/15/2023	85.0	90.0	860.91	859.13	91.65	61.51	799.40
MW-18-97	10/23/2023	85.0	90.0	860.91	859.13	NM	63.53	797.38
MW-18-98	5/15/2023	7.0	12.0	862.16	859.10	NM	5.46	856.70
MW-18-98	10/23/2023	7.0	12.0	862.16	859.10	NM	4.35	857.81
MW-18-99	5/15/2023	9.0	14.0	862.47	859.95	NM	3.90	858.57
MW-18-99	10/23/2023	9.0	14.0	862.47	859.95	NM	3.05	859.42
MW-18-100	5/16/2023	8.0	13.0	863.94	861.49	NM	10.32	853.62
MW-18-100	10/23/2023	8.0	13.0	863.94	861.49	NM	10.17	853.77
MW-18-101	5/16/2023	80.0	85.0	863.87	861.24	NM	61.94	801.93
MW-18-101	10/23/2023	80.0	85.0	863.87	861.24	NM	63.79	800.08
MW-18-102	5/16/2023	10.0	15.0	863.13	863.44	NM	8.31	854.82
MW-18-102	10/24/2023	10.0	15.0	863.13	863.44	NM	12.68	850.45
MW-18-103	5/16/2023	5.0	10.0	859.13	859.74	NM	2.42	856.71
MW-18-103	10/24/2023	5.0	10.0	859.13	859.74	NM	3.14	855.99
MW-18-104	5/16/2023	5.0	10.0	859.12	859.82	NM	2.51	856.61
MW-18-104	10/24/2023	5.0	10.0	859.12	859.82	NM	3.80	855.32
MW-18-105	5/16/2023	6.0	11.0	858.59	859.01	NM	1.31	857.28
MW-18-105	10/24/2023	6.0	11.0	858.59	859.01	NM	1.48	857.11
MW-18-106	5/16/2023	5.0	10.0	866.15	866.51	NM	3.35	862.80
MW-18-106	10/24/2023	5.0	10.0	866.15	866.51	9.55	9.50	856.65
MW-19	5/15/2023	55.0	65.0	859.73	860.01	67.70	44.81	814.92
MW-19	10/23/2023	55.0	65.0	859.73	860.01	67.70	44.85	814.88
MW-19-107	5/16/2023	23.0	28.0	870.65	869.20	NM	16.92	853.73
MW-19-107	10/23/2023	23.0	28.0	870.65	869.20	NM	23.52	847.13

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Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-19-108	5/16/2023	23.0	28.0	872.60	870.22	NM	14.98	857.62
MW-19-108	10/23/2023	23.0	28.0	872.60	870.22	NM	19.99	852.61
MW-19-110	5/15/2023	8.0	13.0	863.67	860.72	NM	DRY	DRY
MW-19-110	10/23/2023	8.0	13.0	863.67	860.72	16.25	DRY	DRY
MW-19-111	5/16/2023	20.0	25.0	874.51	871.70	NM	22.24	852.27
MW-19-111	10/23/2023	20.0	25.0	874.51	871.70	NM	24.77	849.74
MW-19-112	5/15/2023	9.0	14.0	861.63	858.53	NM	6.22	855.41
MW-19-112	10/23/2023	9.0	14.0	861.63	858.53	NM	6.89	854.74
MW-19-113	5/15/2023	16.0	21.0	860.67	857.73	NM	24.32	836.35
MW-19-113	10/23/2023	16.0	21.0	860.67	857.73	NM	24.48	836.19
MW-19-114	5/16/2023	6.0	11.0	861.25	861.79	NM	3.34	857.91
MW-19-114	10/24/2023	6.0	11.0	861.25	861.79	NM	2.71	858.54
MW-19-119D	5/16/2023	180.0	195.0	864.42	861.66	197.90	81.53	782.89
MW-19-119D	10/23/2023	180.0	195.0	864.42	861.66	197.90	84.96	779.46
MW-19-119S	5/16/2023	145.0	160.0	864.32	861.66	163.90	69.01	795.31
MW-19-119S	10/23/2023	145.0	160.0	864.32	861.66	163.90	71.44	792.88
MW-22	5/15/2023	52.5	62.5	859.69	860.08	64.10	45.46	814.23
MW-22	10/23/2023	52.5	62.5	859.69	860.08	64.10	45.99	813.70
MW-23	5/15/2023	52.0	62.0	863.71	859.82	65.60	48.78	814.93
MW-23	10/23/2023	52.0	62.0	863.71	859.82	NM	49.15	814.56
MW-88-1	5/15/2023	103.5	140.0	858.75	859.06	138.60	63.62	795.13
MW-88-1	10/23/2023	103.5	140.0	858.75	859.06	138.60	65.02	793.73
MW-91-2R	5/15/2023	75.0	80.0	866.84	863.63	NM	57.15	809.69
MW-91-2R	10/23/2023	75.0	80.0	866.84	863.63	NM	58.00	808.84
MW-91-3	5/15/2023	105.0	117.0	860.81	859.35	118.95	65.02	795.79
MW-91-3	10/23/2023	105.0	117.0	860.81	859.35	118.95	66.49	794.32
MW-91-4	5/15/2023	116.0	132.5	855.59	855.93	131.95	56.95	798.64
MW-91-4	10/23/2023	116.0	132.5	855.59	855.93	131.95	58.87	796.72
MW-91-5	5/16/2023	112.5	128.0	860.61	861.20	127.70	61.59	799.02
MW-91-5	10/23/2023	112.5	128.0	860.61	861.20	127.70	63.88	796.73
MW-91-6	5/15/2023	82.0	98.0	851.84	852.22	96.15	60.59	791.25
MW-91-6	10/24/2023	82.0	98.0	851.84	852.22	96.15	62.83	789.01
MW-93-1	5/15/2023	65.0	75.0	866.05	863.56	70.20	62.74	803.31
MW-93-1	10/23/2023	65.0	75.0	866.05	863.56	70.20	64.04	802.01
P3-SB-07	5/15/2023	11.0	16.0	866.84	863.63	19.50	7.94	858.90
P3-SB-07	10/23/2023	11.0	16.0	866.84	863.63	19.50	7.17	859.67
P3-SB-28	5/15/2023	8.0	13.0	866.43	863.63	NM	6.14	860.29
P3-SB-28	10/23/2023	8.0	13.0	866.43	863.63	10.35	5.25	861.18
PW-14-03	5/16/2023	85.0	90.0	864.31	861.55	95.50	69.99	794.32
PW-14-03	10/24/2023	85.0	90.0	864.31	861.55	95.50	74.42	789.89
TW-14-06	5/16/2023	82.0	87.0	860.81	861.38	85.55	84.30	776.51
TW-14-06	10/24/2023	82.0	87.0	860.81	861.38	84.80	65.00	795.81
TW-15-11	5/16/2023	85.0	90.0	864.51	861.60	86.90	63.98	800.53
TW-15-11	10/24/2023	85.0	90.0	864.51	861.60	87.05	74.67	789.84
UNK-10	5/15/2023	11.0	16.0	859.34	860.05	15.40	0.33	859.01
UNK-10	10/23/2023	11.0	16.0	859.34	860.05	15.40	0.25	859.09
UNK-11	5/15/2023	6.5	11.5	859.91	860.17	11.75	0.81	859.10
UNK-11	10/23/2023	6.5	11.5	859.91	860.17	11.75	0.19	859.72
UNK-15	5/15/2023	11.0	16.0	859.56	859.94	NM	0.43	859.13
UNK-15	10/23/2023	11.0	16.0	859.56	859.94	NM	0.55	859.01

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-02-02(6)	5/15/2023	35.0	45.0	868.04	868.41	43.35	29.10	838.94
MW-02-02(6)	10/23/2023	35.0	45.0	868.04	868.41	43.38	28.78	839.26
MW-03-02	5/15/2023	30.0	40.0	864.52	864.76	38.18	20.76	843.76
MW-03-02	10/23/2023	30.0	40.0	864.52	864.76	37.94	20.12	844.40
MW-03-04	5/15/2023	33.0	43.0	865.28	865.53	42.62	20.60	844.68
MW-03-04	10/23/2023	33.0	43.0	865.28	865.53	42.65	20.91	844.37
MW-03-05	5/15/2023	35.0	45.0	868.90	869.14	47.99	23.85	845.05
MW-03-05	10/23/2023	35.0	45.0	868.90	869.14	48.02	22.83	846.07
MW-03-06	5/15/2023	30.0	40.0	870.45	870.80	40.58	35.78	834.67
MW-03-06	10/23/2023	30.0	40.0	870.45	870.80	40.58	35.81	834.64
MW-03-08	5/15/2023	35.0	45.0	869.03	869.39	Could Not Access - Well Under Water		
MW-03-08	10/23/2023	35.0	45.0	869.03	869.39	Could Not Access - Well Under Water		
MW-04-01(6)	5/15/2023	78.0	88.0	866.85	867.15	87.95	70.22	796.63
MW-04-01(6)	10/23/2023	78.0	88.0	866.85	867.15	87.95	71.21	795.64
MW-04-04R	5/15/2023	82.0	110.0	873.31	870.64	111.08	75.91	797.40
MW-04-04R	10/23/2023	82.0	110.0	873.31	870.64	111.05	76.98	796.33
MW-04-05(6)	5/16/2023	20.0	30.0	858.33	858.87	29.61	9.20	849.13
MW-04-05(6)	10/23/2023	20.0	30.0	858.33	858.87	29.60	8.84	849.49
MW-04-06R	5/15/2023	74.0	99.5	861.56	858.59	100.20	65.35	796.21
MW-04-06R	10/23/2023	74.0	99.5	861.56	858.59	77.95	66.46	795.10
MW-12-03	5/15/2023	57.0	80.0	859.10	856.71	82.51	62.13	796.97
MW-12-03	10/23/2023	57.0	80.0	859.10	856.71	82.25	62.88	796.22
MW-12-10R	5/16/2023	10.0	15.0	862.29	858.92	17.96	11.28	851.01
MW-12-10R	10/23/2023	10.0	15.0	862.29	858.92	17.95	11.47	850.82
MW-12-11	5/16/2023	13.0	18.0	857.26	857.68	16.80	3.75	853.51
MW-12-11	10/23/2023	13.0	18.0	857.26	857.68	16.80	6.50	850.76
MW-12-12	5/15/2023	13.0	18.0	874.34	874.61	NM	7.41	866.93
MW-12-12	10/23/2023	13.0	18.0	874.34	874.61	17.20	6.40	867.94
MW-12-13	5/15/2023	18.5	23.5	882.60	880.51	NM	10.69	871.91
MW-12-13	10/23/2023	18.5	23.5	882.60	880.51	25.45	10.60	872.00
MW-12-14	5/15/2023	25.0	30.0	872.56	869.28	32.07	25.08	847.48
MW-12-14	10/23/2023	25.0	30.0	872.56	869.28	32.05	26.18	846.38
MW-12-16	5/16/2023	28.0	33.0	864.24	864.73	32.20	22.50	841.74
MW-12-16	10/23/2023	28.0	33.0	864.24	864.73	32.20	23.00	841.24
MW-13-36R	5/15/2023	5.5	10.5	878.04	875.28	12.64	6.43	871.61
MW-13-36R	10/23/2023	5.5	10.5	878.04	875.28	12.70	4.85	873.19
MW-13-50	5/16/2023	85.0	107.0	872.85	869.93	109.87	82.17	790.68
MW-13-50	10/23/2023	85.0	107.0	872.85	869.93	109.80	84.38	788.47
MW-13-52	5/16/2023	70.0	80.0	872.50	869.84	81.43	68.95	803.55
MW-13-52	10/23/2023	70.0	80.0	872.50	869.84	81.40	69.42	803.08
MW-13-53	5/16/2023	73.0	83.0	875.56	873.10	85.42	74.28	801.28
MW-13-53	10/23/2023	73.0	83.0	875.56	873.10	85.40	75.03	800.53
MW-14-66	5/15/2023	14.0	19.0	877.85	874.73	22.22	5.39	872.46
MW-14-66	10/23/2023	14.0	19.0	877.85	874.73	22.21	4.49	873.36
MW-14-67	5/15/2023	13.0	18.0	877.76	875.07	20.83	5.75	872.01
MW-14-67	10/23/2023	13.0	18.0	877.76	875.07	20.83	4.62	873.14
MW-14-69	5/15/2023	41.0	46.0	883.62	880.72	NM	DRY	DRY
MW-14-69	10/23/2023	41.0	46.0	883.62	880.72	49.00	DRY	DRY
MW-14-70	5/15/2023	16.0	21.0	882.79	880.08	23.11	10.86	871.93
MW-14-70	10/23/2023	16.0	21.0	882.79	880.08	23.09	11.48	871.31

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MW-20-131	5/15/2023	5.0	10.0	858.21	858.66	NM	5.11	853.10
MW-20-131	10/23/2023	5.0	10.0	858.21	858.66	8.65	5.25	852.96
MW-20-132	5/15/2023	6.0	11.0	858.01	858.38	NM	5.03	852.98
MW-20-132	10/23/2023	6.0	11.0	858.01	858.38	10.80	5.38	852.63
MW-21-133	5/15/2023	10.0	15.0	876.67	872.91	NM	8.51	868.16
MW-21-133	10/23/2023	10.0	15.0	876.67	872.91	18.74	11.21	865.46
MW-21-134	5/15/2023	11.0	16.0	872.97	869.38	NM	8.54	864.43
MW-21-134	10/23/2023	11.0	16.0	872.97	869.38	20.08	14.53	858.44
MW-21-135	5/15/2023	22.0	27.0	872.10	868.60	NM	25.10	847.00
MW-21-135	10/23/2023	22.0	27.0	872.10	868.60	29.55	26.09	846.01
MW-21-136	5/16/2023	9.0	14.0	865.91	866.31	NM	6.92	858.99
MW-21-136	10/23/2023	9.0	14.0	865.91	866.31	13.75	8.27	857.64
MW-21-137	5/16/2023	7.0	12.0	866.99	867.50	NM	9.15	857.84
MW-21-137	10/23/2023	7.0	12.0	866.99	867.50	11.50	9.65	857.34
MW-21-138	5/16/2023	24.0	29.0	867.05	867.54	NM	21.64	845.41
MW-21-138	10/23/2023	24.0	29.0	867.05	867.54	28.65	21.79	845.26
MW-21-141	5/15/2023	72.0	77.0	874.03	871.05	79.70	77.22	796.81
MW-21-141	10/23/2023	72.0	77.0	874.03	871.05	79.70	78.28	795.75
MW-22-143	5/15/2023	26.0	31.0	864.23	864.52	NM	16.79	847.44
MW-22-143	10/23/2023	26.0	31.0	864.23	864.52	31.02	17.82	846.41
MW-22-144	5/15/2023	19.5	24.5	863.27	863.91	24.08	11.20	852.07
MW-22-144	10/23/2023	19.5	24.5	863.27	863.91	24.05	13.30	849.97
MW-22-145	5/15/2023	10.5	15.5	863.25	863.87	NM	11.38	851.87
MW-22-145	10/23/2023	10.5	15.5	863.25	863.87	14.85	13.48	849.77
MW-22-146	5/15/2023	5.5	10.5	861.74	862.17	NM	4.57	857.17
MW-22-146	10/23/2023	5.5	10.5	861.74	862.17	9.90	7.15	854.59
MW-22-147	5/15/2023	7.5	12.5	865.46	865.83	NM	9.00	856.46
MW-22-147	10/23/2023	7.5	12.5	865.46	865.83	12.20	9.35	856.11
MW-22-148	5/15/2023	24.5	29.5	865.93	866.12	NM	24.65	841.28
MW-22-148	10/23/2023	24.5	29.5	865.93	866.12	29.30	25.25	840.68
MW-22-149	5/15/2023	5.5	10.5	866.24	866.68	NM	5.62	860.62
MW-22-149	10/23/2023	5.5	10.5	866.24	866.68	9.90	5.22	861.02
MW-22-150	5/15/2023	13.0	18.0	859.62	859.84	NM	5.41	854.21
MW-22-150	10/23/2023	13.0	18.0	859.62	859.84	17.95	5.74	853.88
MW-22-151	5/15/2023	13.0	18.0	856.66	857.04	NM	6.38	850.28
MW-22-151	10/23/2023	13.0	18.0	856.66	857.04	14.90	6.36	850.30
MW-22-152	5/15/2023	10.0	15.0	857.23	857.50	NM	7.63	849.60
MW-22-152	10/23/2023	10.0	15.0	857.23	857.50	14.90	7.77	849.46
MW-22-154	5/15/2023	6.0	11.0	855.81	856.29	NM	5.15	850.66
MW-22-154	10/23/2023	6.0	11.0	855.81	856.29	10.58	5.31	850.50
MW-22-158	5/15/2023	16.0	21.0	863.45	863.87	NM	12.95	850.50
MW-22-158	10/23/2023	16.0	21.0	863.45	863.87	20.15	16.38	847.07
MW-22-159	5/15/2023	26.0	31.0	864.41	864.78	NM	DRY	DRY
MW-22-159	10/23/2023	26.0	31.0	864.41	864.78	29.80	DRY	DRY
MW-22-160	5/15/2023	14.0	19.0	860.77	861.40	NM	13.78	846.99
MW-22-160	10/23/2023	14.0	19.0	860.77	861.40	18.15	14.92	845.85
MWBP-10-UST5-6	5/16/2023	28.0	38.0	867.70	867.99	36.81	29.41	838.29
MWBP-10-UST5-6	10/23/2023	28.0	38.0	867.70	867.99	36.80	29.79	837.91
MWBP-11-UST1-4	5/16/2023	9.0	19.0	868.66	869.07	11.23	1.20	867.46
MWBP-11-UST1-4	10/23/2023	9.0	19.0	868.66	869.07	NM	NM	NM

Table 5
Summary of Groundwater Elevations - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
MWBP-12-UST1-4	5/16/2023	15.0	25.0	870.02	870.58	11.30	2.28	867.74
MWBP-12-UST1-4	10/23/2023	15.0	25.0	870.02	870.58	11.30	3.04	866.98
P6-MW-01	5/16/2023	23.0	28.0	870.10	866.87	31.23	28.51	841.59
P6-MW-01	10/23/2023	23.0	28.0	870.10	866.87	31.21	28.90	841.20
P6-SB-07	5/15/2023	15.0	20.0	877.36	874.36	23.63	6.68	870.68
P6-SB-07	10/23/2023	15.0	20.0	877.36	874.36	13.94	6.10	871.26
P6-SB-18	5/15/2023	3.0	8.0	878.72	874.65	12.11	5.92	872.80
P6-SB-18	10/23/2023	3.0	8.0	878.72	874.65	12.08	4.53	874.19
P6-SB-21	5/15/2023	3.0	8.0	874.20	870.92	11.11	2.83	871.37
P6-SB-21	10/23/2023	3.0	8.0	874.20	870.92	11.11	2.20	872.00
P6-SB-35	5/15/2023	3.0	8.0	877.76	874.28	11.98	5.35	872.41
P6-SB-35	10/23/2023	3.0	8.0	877.76	874.28	11.97	4.05	873.71
P6-SB-37	5/15/2023	5.0	10.0	878.12	874.32	13.92	5.76	872.36
P6-SB-37	10/23/2023	5.0	10.0	878.12	874.32	13.94	4.53	873.59
P6-SB-37	10/23/2023	5.0	10.0	878.12	874.32	13.94	4.12	874.00

Notes:
* Groundwater elevations have been corrected for the presence of LNAPL using a measured LNAPL density of 0.8995 gram per milliliter.
bgs = below ground surface
LNAPL = light nonaqueous phase liquid
msl = mean sea level
NM = not measured
NS = not surveyed
RACER = Revitalizing Auto Communities Environmental Response
TOC = top of casing
DRY = well was dry and depth to water could not be gauged

Table 6
Summary of Bedrock Vertical Gradients - Second Quarter 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

		Screen (feet below grade)			Reference Elevation (feet amsl)	Groundwater Elevation 5/15/23-5/16/23 (feet amsl)	Vertical Gradient (ft/ft)	Formation
		Top	Bottom	Mid-point				
Plant 2								
MW-14-63	W. Bedrock	68	73	70.5	854.64	788.86	NA	Grand River Formation
MW-12-02	Bedrock	87	110	98.5	853.91	NM		
MW-13-43	W. Bedrock	72	77	74.5	863.82	799.42	0.38	Saginaw Formation
MW-13-44	Bedrock	96	115	105.5	864.24	787.58		
MW-14-61	W. Bedrock	70	75	72.5	865.51	799.11	0.40	Saginaw Formation
MW-12-06	Bedrock	80.6	99.5	90.1	864.64	792.04		
MW-15-72	W. Bedrock	63	68	65.5	865.09	808.85	0.49	Saginaw Formation
MW-12-05R	Bedrock	100	112	106.0	861.80	789.08		
MW-16-76	W. Bedrock	70	75	72.5	867.76	802.31	0.48	Saginaw Formation
MW-12-01	Bedrock	87	110	98.5	867.94	789.92		
MW-16-83	W. Bedrock	71	76	73.5	862.97	790.36	0.08	Saginaw Formation
MW-17-87	Bedrock	100	112	106.0	862.82	787.67		
MW-15-73*	W. Bedrock	78	83	80.5	861.56	789.80	0.04	Saginaw Formation
MW-19-118S*	Bedrock	145	160	152.5	862.81	786.79		
MW-19-118D*	W. Bedrock	175	190	182.5	862.78	786.75	0.001	Saginaw Formation
MW-19-118S*	Bedrock	145	160	152.5	862.81	786.79		
MW-20-127	W. Bedrock	72	77	74.5	862.58	797.27	0.30	Saginaw Formation
MW-19-125	Bedrock	100	115	107.5	865.11	787.40		

Table 6
Summary of Bedrock Vertical Gradients - Second Quarter 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

		Screen (feet below grade)			Reference Elevation (feet amsl)	Groundwater Elevation 5/15/23-5/16/23 (feet amsl)	Vertical Gradient (ft/ft)	Formation
		Top	Bottom	Mid-point				
Plant 3								
MW-13-22	W. Bedrock	89	94	91.5	864.37	797.14	0.04	Grand River Formation
MW-13-28	Bedrock	99	115.5	107.3	864.42	796.53		
MW-13-46	W. Bedrock	68	73	70.5	854.54	791.72	0.02	Grand River Formation
MW-91-6	Bedrock	82	98	90	851.84	791.25		
MW-04-03(3)	Deep Overburden	80	90	85	860.72	799.86	0.01	Grand River Formation
MW-04-02(3)	Bedrock	126	136	131	861.09	799.23		
MW-04-04(3)	Deep Overburden	72	82	77	855.72	799.91	0.03	Grand River Formation
MW-91-4	Bedrock	116	132.5	124.3	855.59	798.64		
MW-13-41	Deep Overburden	77	82	79.5	863.41	808.66	0.30	Saginaw Formation
MW-13-38	Bedrock	107	124	115.5	866.47	797.78		
Plant 6								
MW-13-52	W. Bedrock	70	80	75	872.50	803.55	0.61	Saginaw Formation
MW-13-50	Bedrock	85	107	96	872.85	790.68		

Notes:
ft/ft = foot per foot
GR Fm = Grand River Formation
amsl = above mean sea level
NA = not applicable
NM = not measured
RACER = Revitalizing Auto Communities Environmental Response
Sag Fm = Saginaw Formation
W. Bedrock = weathered bedrock
** Not used for geometric mean calculation because not consistent with depth of other wells onsite*

Vertical Gradient Geometric Mean Sag Fm	0.34
Vertical Gradient Geometric Mean GR Fm	0.024

Table 7
Mann-Kendall Trend Test Results - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Analyte	Date Range	FOD	Detected Results Summary [1]				Mann-Kendall Test [2]			
				Range	Mean	Median	SD	Result [4]	MK Result Note	P-Value	S Value
CH-14-RO	Perfluorohexanesulfonic acid (PFHxS)	12/16 - 11/23	13 / 13	1000 - 2520	1710	1600	470	DWN	--	0.002	-47
CH-14-RO	Perfluorooctane sulfonic acid (PFOS)	12/16 - 11/23	13 / 13	7100 - 13000	10800	11200	1810	DWN	--	0.012	-38
CH-14-RO	Perfluorooctanoic acid (PFOA)	12/16 - 11/23	13 / 13	57.8 - 190	107	114	33.9	NST	--	0.232	-13
MW-02-02(6)	1,4-Dioxane	10/11 - 10/23	9 / 9	11 - 23	19.7	21	3.7	NST	--	0.500	1
MW-03-06	Vinyl chloride	10/11 - 06/22	14 / 16	4 - 12	9.9	11	2.7	NST	--	0.445	4
MW-12-09	Perfluorooctanoic acid (PFOA)	06/18 - 10/23	10 / 10	11.9 - 16	14.2	14.9	1.4	UP	--	0.030	22
MW-12-12	Perfluorononanoic acid (PFNA)	06/19 - 11/23	18 / 18	3.6 - 12.6	8.2	7.9	2.3	DWN	--	<0.001	-92
MW-12-12	Perfluorooctane sulfonic acid (PFOS)	06/18 - 11/23	19 / 19	22 - 67.5	44.8	43.5	10.9	DWN	--	0.004	-77
MW-12-12	Perfluorooctanoic acid (PFOA)	06/18 - 11/23	19 / 19	52 - 130	86.5	83	19.1	NST	--	0.444	-5
MW-12-21	1,4-Dioxane	02/13 - 11/23	27 / 28	118 - 510	285	251	121	DWN	--	<0.001	-222
MW-13-22	1,4-Dioxane	03/13 - 11/23	35 / 35	45 - 270	153	158	53.3	DWN	--	0.013	-157
MW-13-25	1,4-Dioxane	04/13 - 11/23	20 / 24	3 - 25	11.6	12	6.5	DWN	--	0.089	-55
MW-13-29	1,4-Dioxane	04/13 - 10/23	22 / 22	7 - 130	25.3	20.5	24.9	DWN	--	<0.001	-134
MW-13-34	1,4-Dioxane	08/13 - 11/23	32 / 32	17 - 127	76.8	78.5	22.6	UP	--	<0.001	265
MW-13-36R	Perfluorononanoic acid (PFNA)	06/19 - 10/23	18 / 18	11 - 16.5	13.6	13.8	1.5	NST	--	0.211	22
MW-13-36R	Perfluorooctane sulfonic acid (PFOS)	06/19 - 10/23	18 / 18	37 - 56.7	46	46.1	4.9	DWN	--	0.006	-67
MW-13-36R	Perfluorooctanoic acid (PFOA)	06/19 - 10/23	18 / 18	57.1 - 81.1	68.4	68.45	7.1	NST	--	0.105	34
MW-13-45	1,4-Dioxane	12/13 - 10/23	26 / 27	24 - 58	41.5	41.5	11.2	NST	--	0.385	-15
MW-13-48	1,4-Dioxane	12/13 - 11/23	26 / 26	24 - 380	144	132	89.5	DWN	--	0.049	-76
MW-14-56	1,4-Dioxane	09/14 - 10/23	16 / 18	6 - 17	9.4	8.5	3.4	UP	--	<0.001	105
MW-14-58R	1,4-Dioxane	12/21 - 10/23	10 / 10	173 - 520	283	222	128	DWN	--	0.019	-24
MW-14-59	Perfluorooctanoic acid (PFOA)	06/18 - 10/23	9 / 10	6.7 - 15	9.4	8.8	2.3	NST	--	0.300	7
MW-14-59	1,1-Dichloroethene	09/14 - 06/22	11 / 11	16 - 39	25.2	24	7.3	DWN	--	0.036	-24
MW-14-59	1,4-Dioxane	09/14 - 10/23	13 / 13	7 - 280	121	80	98.5	DWN	--	<0.001	-71
MW-14-60	Perfluorooctane sulfonic acid (PFOS)	05/18 - 10/23	9 / 10	5.6 - 44	24.3	28	13.1	NST	--	0.108	15
MW-14-60	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	10 / 10	14.7 - 41	29.4	30.6	10.3	UP	--	0.019	24
MW-14-60	1,4-Dioxane	09/14 - 10/23	13 / 13	6 - 200	112	131	64.3	DWN	--	<0.001	-72
MW-14-60	Vinyl chloride	09/14 - 06/22	11 / 11	2 - 12	5.5	4	3.3	UP	--	0.064	20
MW-14-61	1,4-Dioxane	09/14 - 10/23	20 / 23	5 - 152	50.8	17	60.1	NST	--	0.262	25
MW-14-62	Perfluorononanoic acid (PFNA)	05/18 - 10/23	10 / 10	5.1 - 11.9	8.1	7.7	1.9	NST	--	0.398	-4
MW-14-62	Perfluorooctane sulfonic acid (PFOS)	05/18 - 10/23	10 / 10	47 - 86.8	63.2	60.5	13.5	DWN	--	0.066	-18
MW-14-62	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	10 / 10	36.5 - 94.3	56.8	52.5	16.3	NST	--	0.431	-3
MW-14-62	1,4-Dioxane	09/14 - 10/23	13 / 13	27 - 230	86.3	63	63.3	NST	--	0.214	-14
MW-14-67	Perfluorooctanoic acid (PFOA)	06/19 - 10/23	17 / 17	10.3 - 27.1	15.6	13	5.3	UP	--	0.063	38
MW-14-70	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	18 / 18	6.6 - 51.9	27.5	30.75	13.3	NST	--	0.105	-34

Table 7
Mann-Kendall Trend Test Results - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Analyte	Date Range	FOD	Detected Results Summary [1]				Mann-Kendall Test [2]			
				Range	Mean	Median	SD	Result [4]	MK Result Note	P-Value	S Value
MW-15-72	1,4-Dioxane	03/16 - 10/23	25 / 25	11 - 310	184	199	93.7	DWN	--	0.021	-88
MW-16-80	1,4-Dioxane	06/16 - 10/23	15 / 16	7 - 46	24.3	23	8	DWN	--	0.087	-31
MW-16-81	1,4-Dioxane	06/16 - 10/23	26 / 26	70 - 3200	978	535	991	NST	--	0.207	-38
MW-16-84	1,4-Dioxane	09/16 - 10/23	25 / 25	15 - 81	50.8	52	15.4	NST	--	0.426	9
MW-16-85	1,4-Dioxane	12/16 - 10/23	15 / 15	1 - 28	8.9	7	6.8	UP	--	0.097	27
MW-17-86	1,4-Dioxane	04/17 - 10/23	18 / 18	11 - 106	57.3	58.5	32.2	DWN	--	0.092	-36
MW-18-103	Perfluorohexanesulfonic acid (PFHxS)	03/19 - 11/23	18 / 18	16.8 - 190	54.8	46.35	42	UP	--	<0.001	98
MW-18-88	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	19 / 19	46.1 - 860	201	155	178	UP	--	0.005	74
MW-18-88	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	19 / 19	3.1 - 17	6.8	6.1	3.2	UP	--	0.005	74
MW-18-89	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	18 / 18	74 - 289	149	150.5	45	NST	--	0.152	-28
MW-18-89	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	18 / 18	10 - 21.4	13.5	13	2.9	DWN	--	0.069	-40
MW-18-90	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	18 / 18	230 - 1200	949	972.5	197	NST	--	0.410	-7
MW-18-90	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	18 / 18	8.1 - 21.3	16.4	16.5	3.1	DWN	--	0.074	-39
MW-18-91	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	18 / 18	41 - 89	56.3	52.7	12.7	DWN	--	0.007	-66
MW-18-95	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	19 / 19	27 - 115	48.5	41	23.5	DWN	--	0.014	-64
MW-18-98	Perfluorononanoic acid (PFNA)	03/19 - 11/23	14 / 20	0.93 - 13	3.5	2.5	3.5	UP	--	<0.001	134
MW-18-98	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	20 / 20	33 - 440	147	109.5	111	NST	--	0.128	36
MW-18-98	Perfluorooctanoic acid (PFOA)	03/19 - 11/23	20 / 20	1.7 - 42	19.5	18.05	12.5	DWN	--	0.001	-96
MW-18-99	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	20 / 20	46.7 - 170	89.4	79.6	33.8	NST	--	0.361	-12
MW-19-115	1,4-Dioxane	03/20 - 10/23	12 / 12	2 - 13	7.4	7.5	3.3	DWN	--	0.081	-21
MW-19-116	1,4-Dioxane	03/20 - 10/23	12 / 12	54 - 82	66.3	66.5	9.1	NST	--	0.339	7
MW-19-120	1,4-Dioxane	12/19 - 10/23	13 / 13	7 - 198	69.8	28	73.7	DWN	--	<0.001	-53
MW-19-123	1,4-Dioxane	12/19 - 10/23	16 / 16	20 - 76	46.5	47	18.1	DWN	--	0.088	-31
MW-19-124	1,4-Dioxane	12/19 - 10/23	12 / 12	90 - 420	206	189.5	83.9	DWN	--	0.043	-26
MW-20-126	1,4-Dioxane	07/20 - 10/23	14 / 14	63 - 370	171	136.5	106	DWN	--	<0.001	-81
MW-20-127	1,4-Dioxane	07/20 - 10/23	14 / 14	85 - 180	138	139	22.6	UP	--	0.045	32
MW-20-129	1,4-Dioxane	07/20 - 10/23	14 / 14	60 - 140	93.4	82.5	24.9	DWN	--	<0.001	-60
MW-20-130	1,4-Dioxane	12/20 - 10/23	7 / 7	6 - 115	45.4	38	40.6	NST	5a	0.119	-9
MW-20-131	Perfluorooctanoic acid (PFOA)	02/21 - 10/23	8 / 8	27 - 45	37.1	38	5.5	NST	--	0.500	1
MW-20-131	Vinyl chloride	12/20 - 08/23	7 / 7	2 - 5	3.1	3	1.1	NST	5a	0.281	-5
MW-20-132	Perfluorononanoic acid (PFNA)	02/21 - 10/23	8 / 8	2.1 - 8.1	6.3	7.2	2.2	NST	--	0.199	-8
MW-20-132	Perfluorooctane sulfonic acid (PFOS)	02/21 - 10/23	8 / 8	6.9 - 20.2	15.8	17.5	4.8	DWN	--	0.024	-17
MW-20-132	Perfluorooctanoic acid (PFOA)	02/21 - 10/23	8 / 8	13 - 50	36.7	40	11.6	NST	--	0.138	-10
MW-20-132	Vinyl chloride	12/20 - 08/23	6 / 7	1 - 3	2.5	3	0.84	NST	5a	0.386	-3
MW-21-133	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	8 / 8	16 - 110	63.1	53.9	35.8	NST	--	0.406	3
MW-21-134	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	8 / 8	22.6 - 55	34.9	34.3	10.8	NST	--	0.274	6
MW-21-135	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	8 / 8	38 - 63	46.3	45.5	7.6	NST	--	0.452	-2

Table 7
Mann-Kendall Trend Test Results - 2023
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Analyte	Date Range	FOD	Detected Results Summary [1]				Mann-Kendall Test [2]			
				Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
MW-21-139	Perfluorohexanesulfonic acid (PFHxS)	12/21 - 10/23	7 / 7	180 - 300	254	260	39.9	NST	5a	0.236	6
MW-21-139	Perfluorononanoic acid (PFNA)	12/21 - 10/23	7 / 7	6.5 - 27	18.4	18	6.5	NST	5a	0.119	9
MW-21-139	Perfluorooctane sulfonic acid (PFOS)	12/21 - 10/23	7 / 7	680 - 2100	1500	1700	505	NST	5a	0.334	4
MW-21-139	Perfluorooctanoic acid (PFOA)	12/21 - 10/23	7 / 7	49 - 110	85.1	84	19.2	NST	5a	0.281	5
MW-22-144	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	8 / 8	5 - 12	7.3	6.95	2.3	NST	--	0.406	3
MW-22-145	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	8 / 8	11 - 32	18.9	18	6.4	NST	--	0.237	7
MW-22-151	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	8 / 8	7.7 - 9.4	8.3	8.05	0.57	NST	--	0.317	5
MW-22-153	1,4-Dioxane	04/22 - 10/23	9 / 9	18 - 101	60.4	55	29.2	NST	--	0.238	-8
P2-MW-04	1,4-Dioxane	08/11 - 10/23	14 / 15	11 - 62	40.4	44.5	16	DWN	--	0.010	-48
P6-SB-07	Perfluorononanoic acid (PFNA)	06/19 - 11/23	17 / 17	74.6 - 220	139	140	47.7	NST	--	0.217	20
P6-SB-07	Perfluorooctane sulfonic acid (PFOS)	06/18 - 11/23	18 / 18	38 - 126	74	66.6	25.6	NST	--	0.410	-7
P6-SB-07	Perfluorooctanoic acid (PFOA)	06/18 - 11/23	18 / 18	640 - 1930	1280	1330	389	NST	--	0.470	3
PW-14-02	1,4-Dioxane	09/14 - 10/23	27 / 27	5 - 580	159	103	155	DWN	--	<0.001	-246
TW-14-02	1,4-Dioxane	06/15 - 10/23	27 / 34	3 - 3500	1100	400	1230	DWN	--	<0.001	-341
TW-15-11	1,4-Dioxane	06/15 - 11/23	19 / 19	5 - 250	102	51	92	DWN	--	<0.001	-92
UNK-15	Perfluorooctane sulfonic acid (PFOS)	06/19 - 11/23	17 / 17	810 - 1530	1170	1170	184	NST	--	0.170	-24
UNK-15	Perfluorooctanoic acid (PFOA)	06/19 - 11/23	17 / 17	24 - 49.1	34.4	33.1	7.1	DWN	--	<0.001	-78

Abbreviations:

-- insufficient data for calculating statistics (n < 4) or not available
FOD = frequency of detection (# detects / # samples)
mean = arithmetic mean
SD = standard deviation
NST = no significant trend
NT = no trend
DWN = downward trend
UP = upward trend

Notes:

1. All analytical results for PFAS are in ng/L and VOCs are in µg/L.
Result values less than 10 are reported to 2 significant figures; values greater than 10 are reported to 3 significant figures. P-values are reported to 3 decimal places.
2. Trend results are presented when at least seven samples, 50% detected values, and 25% exceedances in the last six samples are available. Significance of trends evaluated at 90% confidence (alpha = 0.1).
3. Non-detects were assigned a common value less than the minimum detected value, equal to half the minimum reporting limit (RL) in the dataset (USEPA, 2009).
If half the minimum RL was greater than the minimum detected value, then half the minimum detect was assigned.
4. Statistically significant trend defined as having p-value ≤ 0.1, or 90% confidence.
5a. MK and Sen's Trend results for datasets with fewer than 8 samples may not be reliable and should be treated with caution.
6. All well/analyte pairs were analyzed in 2023, except for 1,1-DCE at MW-14-59 and vinyl chloride at MW-03-06 and MW-14-60.
These datasets are still included in the MK results since the wells were sampled in 2023.

Reference:

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA/530/R-09/007, 2009.

Table 8
Summary of Plant 2 Storm Sewer Sampling Analytical Results
RACER Trust - Plant 2 Industrial Land, Lansing, Michigan

Location ID: / Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P2-MH-2 2/7/2023	P2-MH-2 4/25/2023	P2-MH-2 7/25/2023	P2-MH-2 10/24/2023	P2-MH-W 2/7/2023	P2-MH-W 4/25/2023	P2-MH-W 7/25/2023	P2-MH-W 10/24/2023
Results										
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	7.6	6.4	17	18	<3.8	1.7 J	<3.9	7.3 [3.9]
Perfluorooctanoic acid (PFOA)	ng/L	170	13.0	8.2	14	20	2.1 J	2.0 J	2.1 J	3.4 J [2.8 J]
Perfluorobutanesulfonic acid (PFBS)	ng/L	670,000	<4.0	1.5 J	2.9 J	2.2 J	1.5 J	1.1 J	<3.9	1.2 J [1.4 J]
Perfluorohexanesulfonic acid (PFHxS)	ng/L	210	2.0 J	1.6 J	3.4 J	4.4	1.5 J	1.1 J	1.6 J	<3.9 [<3.8]
Perfluorononanoic acid (PFNA)	ng/L	30	1.5 J	<3.9	1.9 J	2.9 J	<3.8	<3.9	<3.9	2.5 J [2.4 J]
Other PFAS	ng/L	NC	37.4	22.7	34.3	40.4	6.4	7.1	4.1	6.1 [6.1]

Notes:

Shaded — Exceeds Rule 57 Human Non-Cancer Screening Value for Surface Water from a Non-Drinking Water Source for PFOS or PFOA

NC = No criteria
ng/L = Nanograms per liter
PFAS = Per- and polyfluoroalkyl substances
[ ] Indicates duplicate sample
J = Indicates an estimated value below laboratory reporting limit
< = The compound was analyzed for but not detected.
All samples analyzed using USEPA Method 537M, Michigan List of 28

Table 9
Summary of Plant 3 Storm Sewer Sampling Analytical Results
RACER Trust - Plant 3 Industrial Land, Lansing, Michigan

Location ID: / Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P3-MH-284 2/7/2023	P3-MH-284 4/25/2023	P3-MH-284 7/25/2023	P3-MH-284 10/24/2023
Results						
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	3.1 J	5.9	5.1	7.0
Perfluorooctanoic acid (PFOA)	ng/L	170	1.4 J	2.1 J	<4.0	<3.9
Perfluorobutanesulfonic acid (PFBS)	ng/L	670,000	1.6 J	2.3 J	<4.0	0.92 J
Perfluorohexanesulfonic acid (PFHxS)	ng/L	210	<4.3	<3.9	<4.0	<3.9
Perfluorononanoic acid (PFNA)	ng/L	30	<4.3	<3.9	<4.0	<3.9
Other PFAS	ng/L	NC	8.0	6.7	4.2	3.0

Notes:

Shaded — Exceeds Rule 57 Human Non-Cancer Screening Value for Surface Water from a Non-Drinking Water Source for PFOS or PFOA

NC = No criteria

ng/L = Nanograms per liter

PFAS = Per- and polyfluoroalkyl substances

J = Indicates an estimated value below laboratory reporting limit

< = The compound was analyzed for but not detected.

All samples analyzed using USEPA Method 537M, Michigan List of 28

Table 10
Summary of Plant 6 Storm Sewer Sampling Analytical Results
RACER Trust - Plant 6 Industrial Land, Lansing, Michigan

Location ID: / Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	MichAve-MH-3 2/7/2023	MichAve-MH-3 4/25/2023	MichAve-MH-3 7/25/2023	MichAve-MH-3 10/24/2023	Osborn-MH-1 2/7/2023	Osborn-MH-1 4/25/2023	Osborn-MH-1 7/25/2023	Osborn-MH-1_N 10/24/2023	Osborn-MH-1_E 10/24/2023	Osborn-MH-1_SE 4/25/2023
Results												
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	3.3 J	2.4 J	4.9	3.7 J	43 [45]	16 [16]	14 [14]	18	20	16
Perfluorooctanoic acid (PFOA)	ng/L	170	3.9 J	4.4	5.9	4.5	43 [43]	26 [25]	27 [23]	26	25	16
Perfluorobutanesulfonic acid (PFBS)	ng/L	670,000	<4.2	3.7 J	<4.1	2.5 J	<4.1 [<3.9]	1.4 J [1.6 J]	1.7 J [1.8 J]	1.7 J	<4.0	1.5 J
Perfluorohexanesulfonic acid (PFHxS)	ng/L	210	<4.2	4.0	5.1	2.6 J	1.9 J [<3.9]	1.9 J [1.8 J]	2.1 J [2.3 J]	1.9 J	2.1 J	1.7 J
Perfluorononanoic acid (PFNA)	ng/L	30	<4.2	<4.0	<4.1	<4.0	12 [13]	4.7 [4.5]	3.1 J [3.0 J]	5.2	5.4	1.5 J
Other PFAS	ng/L	NC	20.1	19.1	17.4	12.6	92.0 [95.0]	65.5 [65.6]	49.9 [48.6]	58.4	56.6	28.4

Location ID: / Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	Osborn-MH-1_SE 10/24/2023	Osborn-MH-1_SW 4/25/2023	Osborn-MH-1_SW 7/25/2023	Osborn-MH-1_SW 10/24/2023	Osborn-MH-2_W 10/24/2023	Osborn-MH-2_SE 10/24/2023	Osborn-MH-3 7/25/2023	Osborn-MH-3 10/24/2023	Osborn-MH-4 10/24/2023	Osborn-MH-4_NE 10/24/2023
Results												
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	16	25	47	27 [28]	10	15	52	14	17	31
Perfluorooctanoic acid (PFOA)	ng/L	170	12	32	49	29 [31]	24	19	40	25	11	14
Perfluorobutanesulfonic acid (PFBS)	ng/L	670,000	1.1 J	<3.7	2.2 J	<3.9 [<4.1]	1.1 J	0.96 J	1.6 J	1.0 J	1.1 J	1.2 J
Perfluorohexanesulfonic acid (PFHxS)	ng/L	210	1.2 J	1.9 J	2.9 J	1.4 J [1.7 J]	1.1 J	0.81 J	2.1 J	1.1 J	1.1 J	1.3 J
Perfluorononanoic acid (PFNA)	ng/L	30	1.5 J	7.4	14	6.2 [7.3]	2.1 J	2.7 J	8.4	2.3 J	1.4 J	1.7 J
Other PFAS	ng/L	NC	21.0	94.0	166.0	74.3 [74.8]	45.4	32.7	58.5	41.3	20.8	26.0

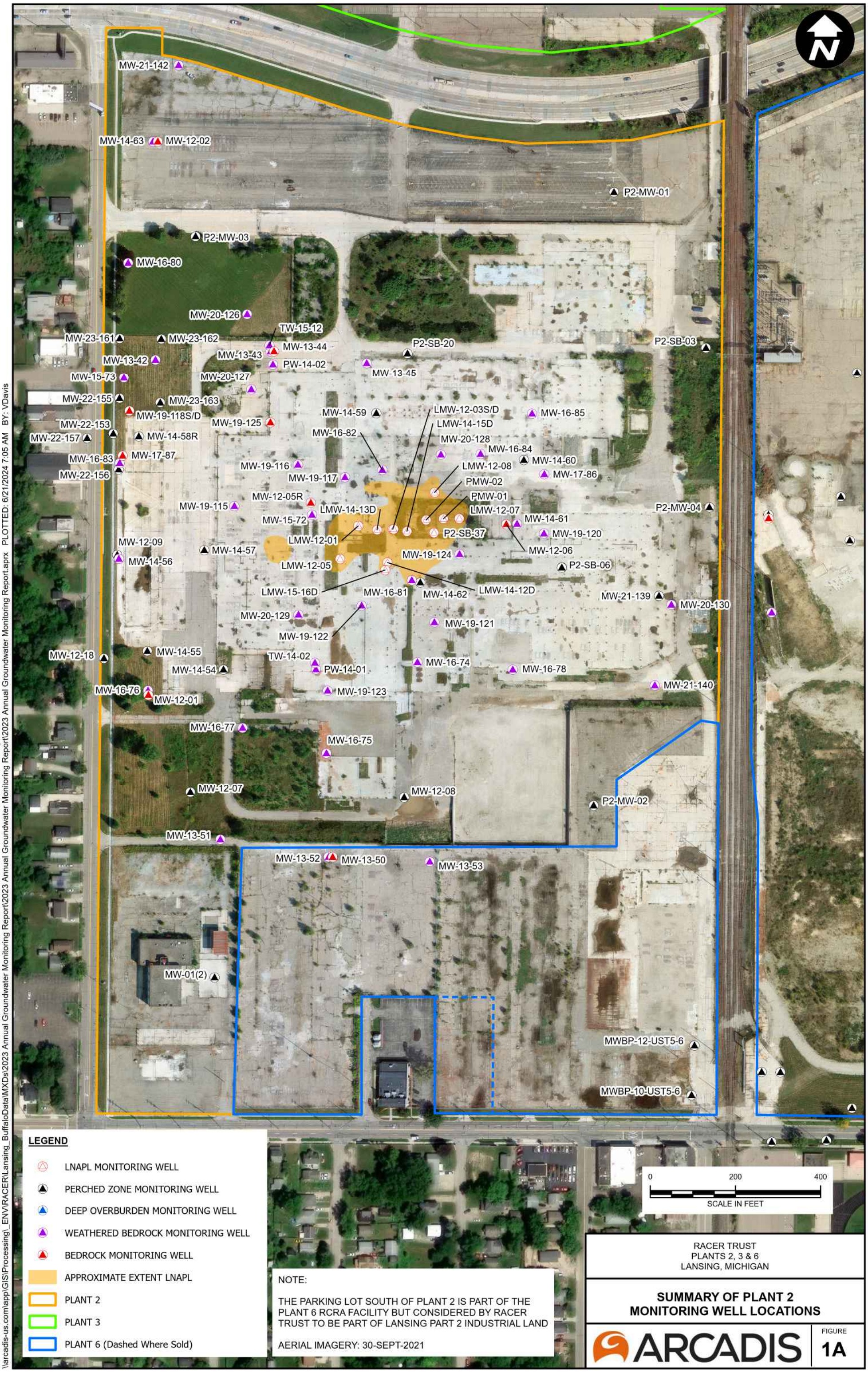
Location ID: / Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	Osborn-MH-4_E 10/24/2023	Osborn-CB-2 4/25/2023	Osborn-CB-2 7/25/2023	Osborn-CB-2 10/24/2023	Stanley-MH-1 10/24/2023	Verlinden-MH-5 2/7/2023	Verlinden-MH-5 4/25/2023	Verlinden-MH-5 7/25/2023	Verlinden-MH-5 10/24/2023
Results											
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	10	15	23	16	22	5.4	13	11	13
Perfluorooctanoic acid (PFOA)	ng/L	170	9.5	26	26	19	30	28	31	26	39
Perfluorobutanesulfonic acid (PFBS)	ng/L	670,000	1.0 J	1.0 J	1.4 J	1.0 J	<4.0	2.9 J	4.0	4.1	2.8 J
Perfluorohexanesulfonic acid (PFHxS)	ng/L	210	0.98 J	1.2 J	1.8 J	0.95 J	2.0 J	1.4 J	1.4 J	2.1 J	1.3 J
Perfluorononanoic acid (PFNA)	ng/L	30	1.3 J	3.7 J	4.2	2.7 J	4.9	2.1 J	3.2 J	3.0 J	4.0 J
Other PFAS	ng/L	NC	20.8	50.5	61.1	31.4	60.6	89.4	71.4	80.1	88.2

Notes:

Shaded — Exceeds Rule 57 Human Non-Cancer Screening Value for Surface Water from a Non-Drinking Water Source for PFOS or PFOA

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All samples analyzed using USEPA Method 537M, Michigan List of 28

Figures



LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- APPROXIMATE EXTENT LNAPL
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

NOTE:

THE PARKING LOT SOUTH OF PLANT 2 IS PART OF THE PLANT 6 RCRA FACILITY BUT CONSIDERED BY RACER TRUST TO BE PART OF LANSING PART 2 INDUSTRIAL LAND

AERIAL IMAGERY: 30-SEPT-2021

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PLANT 2 MONITORING WELL LOCATIONS

ARCADIS

FIGURE
1A

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report.aprx PLOTTED: 6/21/2024 7:05 AM BY: VDavis

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report\2023 Annu

LEGEND

- SOIL VAPOR MONITORING POINT
- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

NOTE:

AERIAL IMAGERY: 30-SEPT-2021

MW-12-03
MW-22-151
MW-22-152
MW-22-150
MW-12-10R
SVMP-20-01
MW-22-154
MW-04-06R
MW-20-132
MW-20-131
MW-12-11
MW-04-05
MW-03-02
MW-12-12
MW-14-70
MW-03-05
MW-02-01(6)
P6-SB-18
MW-12-13
MW-03-07
MW-14-66
MW-14-69
MW-04-01(6)
MW-02-02(6)
MW-03-06
MW-14-67
MW-03-08
MW-04-04R
MW-21-141
MW-22-149
MW-13-36R
P6-SB-21
MW-22-148
P6-SB-07
MW-21-133
MW-22-147
MW-22-146
MW-21-134
MW-21-135
MW-22-160
MWBP-11-UST1-4
MWBP-12-UST1-4
MW-12-14
MW-22-144
P6-MW-01
MW-22-145
MW-22-143
MW-22-159
MW-12-16
MW-21-137
MW-13-35
MW-21-136
MW-21-138
MW-22-158

0 225 450
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PLANT 6 MONITORING WELL LOCATIONS

ARCADIS

FIGURE 1B

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\P

MW-13-39B
MW-91-4
MW-88-1
MW-19-113
MW-18-97
MW-18-98
MW-19-112
MW-02-04(3)
MW-13-40
MW-02-03(3)
MW-12-04
MW-04-03(3)
MW-18-99
MW-19-110
MW-04-02(3)
MW-18-89
MW-13-38
MW-18-90
MW-91-3
MW-13-41
MW-02-02(3)
MW-93-1
MW-18-103
MW-18-102
MW-19-107
MW-06
UNK-15
MW-91-2R
LMW-12-09
MW-05
MW-23
MW-18-92
MW-18-101
MW-13-37
MW-01(3)
UNK-11
MW-18-93
MW-18-88
MW-19-108
CH-14-RO
MW-22
MW-18-91
MW-18-105
MW-18-104
MW-19-111
P3-SB-28
LMW-12-10
MW-18-94
MW-18-95
MW-18-96
MW-19-114
MW-18-100
MW-18-106
MW-13-26
MW-15-71
MW-12-20
MW-02-01(3)
MW-04-01(3)
MW-13-30
MW-13-22
MW-13-28
MW-13-27
MW-13-24
MW-13-23
MW-91-5
MW-12-21
MW-14-64
TW-15-11
PW-14-03
MW-19-119S/D
MW-13-32
MW-13-29
MW-13-25
MW-13-48
MW-13-49
MW-91-6
MW-13-47
MW-13-34
MW-13-46
MW-12-03

NOTE:

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- APPROXIMATE EXTENT LNAPL
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 275 550

SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PLANT 3 MONITORING WELL LOCATIONS

ARCADIS

FIGURE 1C

MW-22-155
2/15/2023: 36
5/17/2023: 270
8/29/2023: 160
10/24/2023: 176

MW-23-161
10/24/2023: 54

MW-23-162
10/24/2023: 28

MW-23-163
10/24/2023: 12

MW-14-59

MW-14-60

MW-22-153
2/15/2023: 26
5/17/2023: 61
8/29/2023: 18
10/24/2023: 101

MW-14-58R
2/15/2023: 178
5/16/2023: 173
8/29/2023: 250
10/24/2023: 194

MW-14-57

P2-MW-04
10/25/2023: 22

MW-03-05

MW-02-02(6)
10/30/2023: 23

MW-03-06

MW-22-157
2/15/2023: 5
5/17/2023: 44
8/29/2023: 123
10/24/2023: 115

MW-14-62
10/26/2023: 70

MW-21-139

MW-22-156
2/15/2023: 47
5/17/2023: 101
8/29/2023: 144
10/24/2023: 140

NOTES:

APPROXIMATE EXTENT OF PERCHED 1,4-DIOXANE PLUME IS BASED ON THE ANALYTICAL DATA FROM THE MOST RECENT SAMPLING EVENT.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 8260B SIM.

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ug/L: MICROGRAMS PER LITER.

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- PERCHED ZONE MONITORING WELL
- WELLS SAMPLED AND 1,4-DIOXANE EXCEEDS DW CRITERIA (7.2 ug/L)
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- PERCHED 1,4-DIOXANE IMPACTS > DW CRITERIA (7.2 ug/L)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE ANALYTICAL RESULTS PERCHED WELLS - 2023

ARCADIS

FIGURE
2

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
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NOTES:

LOWER 1,4-DIOXANE PLUME IS BASED ON THE ANALYTICAL DATA FROM THE MOST RECENT (OCTOBER 2023) SAMPLING EVENT.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD SW-846 8260B SIM.

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ug/L: MICROGRAMS PER LITER.

AERIAL IMAGERY: 09-02-2024

MW-12-21
02/17/2023: 141
05/19/2023: 167
08/30/2023: 199
11/01/2023: 118

MW-13-22
02/17/2023: 171
05/19/2023: 179
08/30/2023: 138
11/01/2023: 135

MW-13-30

PW-14-03R

MW-13-27
05/20/2023: 10
11/01/2023: 6

MW-13-23

MW-13-29
05/19/2023: 9
10/26/2023: 7

MW-13-25

MW-13-48
05/19/2023: 62
11/02/2023: 61

TW-15-11
02/17/2023: 17
05/20/2023: 47
08/30/2023: 120
11/02/2023: 108

MW-13-46

MW-13-34
02/17/2023: 85
05/19/2023: 109
08/30/2023: 106
11/02/2023: 82

MW-21-142
05/18/2023: 82
10/30/2023: 70

MW-14-63

MW-20-126
02/16/2023: 82
05/18/2023: 81
08/30/2023: 88
10/30/2023: 63

PW-14-02
02/16/2023: 18
05/18/2023: 14
08/30/2023: 5
10/26/2023: 7

MW-16-80
10/28/2023: 22

MW-20-127
02/16/2023: 146
05/17/2023: 155
08/30/2023: 180
10/26/2023: 132

TW-15-12

MW-13-45
05/16/2023: 28
10/28/2023: 25

MW-16-85
05/18/2023: 6
10/28/2023: 28

MW-13-43

MW-16-84
05/17/2023: 44
10/28/2023: 39

MW-19-116
05/17/2023: 81
10/27/2023: 61

MW-17-86
05/17/2023: 20
10/27/2023: 16

MW-19-115
05/17/2023: 8
10/27/2023: 6

MW-20-128

MW-16-82

MW-19-117

MW-14-61
05/17/2023: 13
10/26/2023: 13

MW-15-72
05/17/2023: 199
10/27/2023: 67

MW-19-120
05/18/2023: 15
10/28/2023: 11

MW-14-56
10/27/2023: 17

MW-19-124
05/18/2023: 172
10/30/2023: 143

MW-21-141

MW-16-81
05/17/2023: 168
10/27/2023: 99

MW-19-121

MW-16-74

MW-16-78

MW-21-140

MW-20-130
05/18/2023: 6
10/27/2023: 75

MW-20-129
02/16/2023: 71
05/18/2023: 103
08/07/2023: 75
08/29/2023: 74
10/30/2023: 71

MW-16-76

MW-16-77

PW-14-01

MW-16-75

TW-14-02
02/16/2023: 3
05/18/2023: 8
08/30/2023: 220
10/26/2023: <1

MW-19-122
02/16/2023: 3
05/18/2023: 2
08/07/2023: 5
08/29/2023: 8
10/30/2023: <4

MW-19-123
02/16/2023: 26
05/17/2023: 44
08/07/2023: 53
08/29/2023: 72
10/26/2023: 39

LEGEND

- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- WELLS SAMPLED AND 1,4-DIOXANE EXCEEDS DW CRITERIA (7.2 ug/L)
- LOWER 1,4-DIOXANE PLUME > 72 ug/L
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA
- BIOSPARGE
- POTENTIAL Off-SITE DEEP 1,4-DIOXANE PLUME > DW CRITERIA
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 400 800
SCALE IN FEET

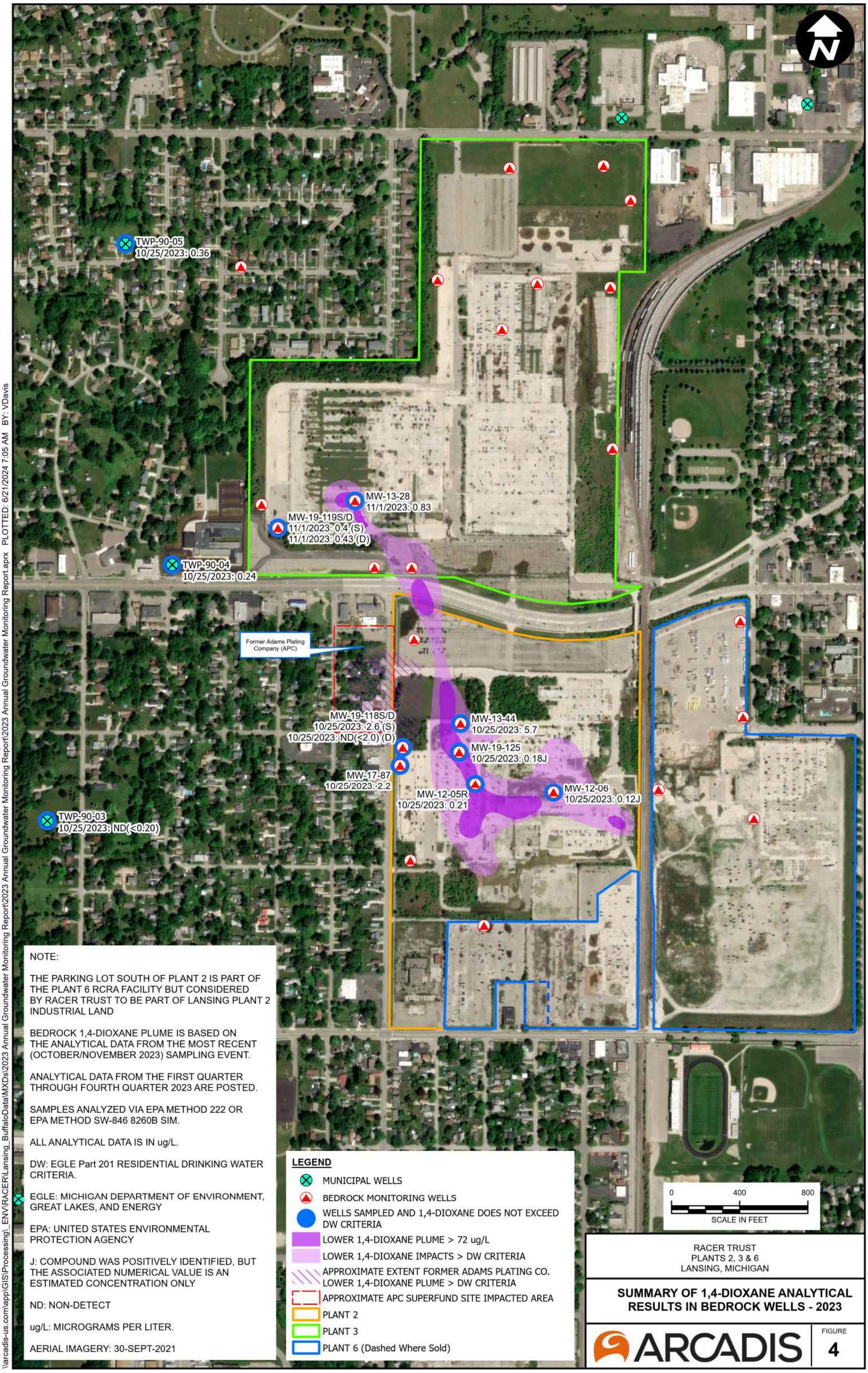
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE ANALYTICAL RESULTS IN LOWER WELLS - 2023

ARCADIS

FIGURE
3

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: L. CRISP TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
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NOTE:

THE PARKING LOT SOUTH OF PLANT 2 IS PART OF THE PLANT 6 RCRA FACILITY BUT CONSIDERED BY RACER TRUST TO BE PART OF LANSING PLANT 2 INDUSTRIAL LAND

BEDROCK 1,4-DIOXANE PLUME IS BASED ON THE ANALYTICAL DATA FROM THE MOST RECENT (OCTOBER/NOVEMBER 2023) SAMPLING EVENT.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 222 OR EPA METHOD SW-846 8260B SIM.

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

J: COMPOUND WAS POSITIVELY IDENTIFIED, BUT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY

ND: NON-DETECT

ug/L: MICROGRAMS PER LITER.

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- MUNICIPAL WELLS
- BEDROCK MONITORING WELLS
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- LOWER 1,4-DIOXANE PLUME > 72 ug/L
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA
- APPROXIMATE EXTENT FORMER ADAMS PLATING CO. LOWER 1,4-DIOXANE PLUME > DW CRITERIA
- APPROXIMATE APC SUPERFUND SITE IMPACTED AREA
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

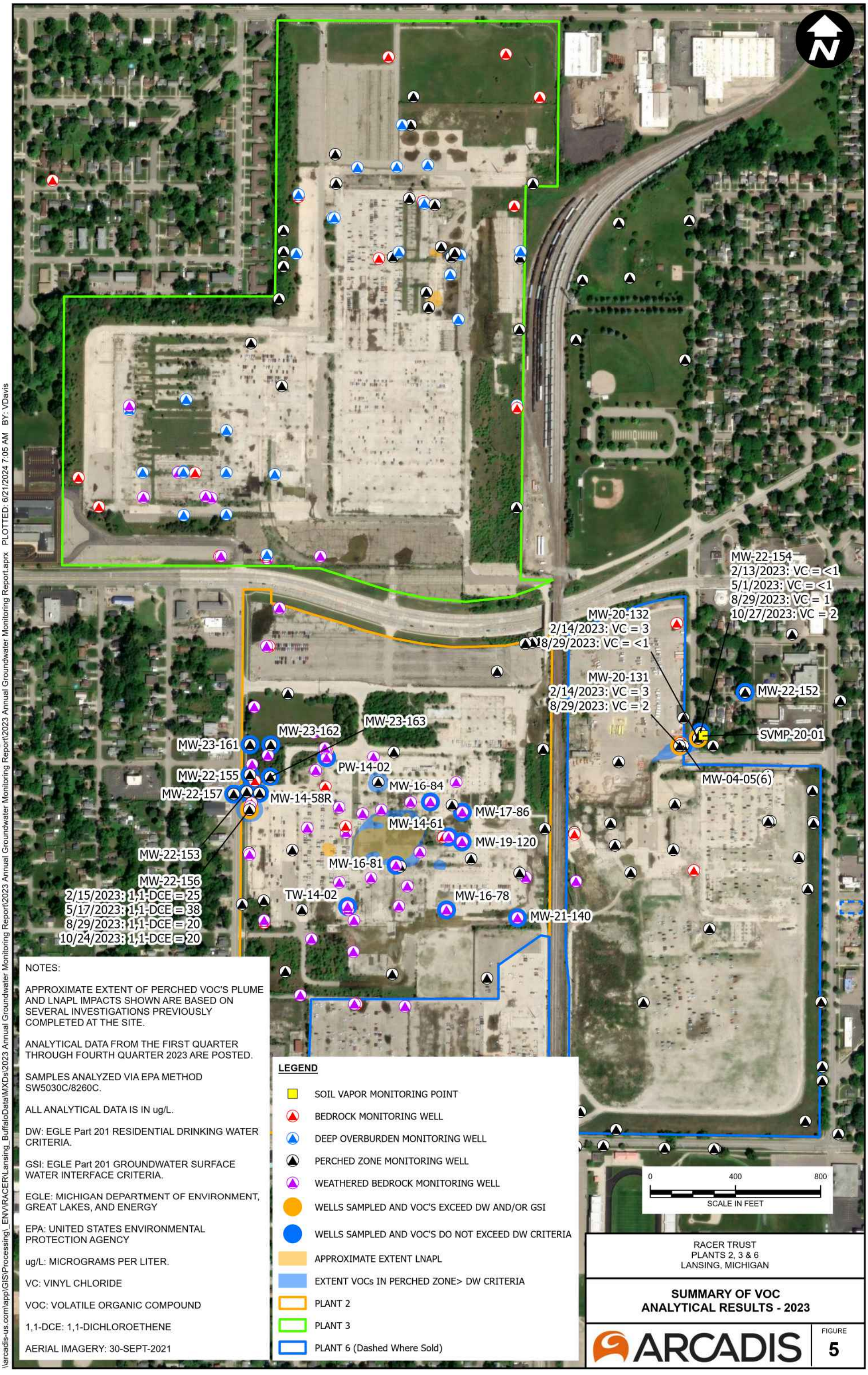
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE ANALYTICAL RESULTS IN BEDROCK WELLS - 2023

ARCADIS

FIGURE
4

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
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NOTES:

APPROXIMATE EXTENT OF PERCHED VOC'S PLUME AND LNAPL IMPACTS SHOWN ARE BASED ON SEVERAL INVESTIGATIONS PREVIOUSLY COMPLETED AT THE SITE.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD SW5030C/8260C.

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

GSI: EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ug/L: MICROGRAMS PER LITER.

VC: VINYL CHLORIDE

VOC: VOLATILE ORGANIC COMPOUND

1,1-DCE: 1,1-DICHLOROETHENE

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- SOIL VAPOR MONITORING POINT
- BEDROCK MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- PERCHED ZONE MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- WELLS SAMPLED AND VOC'S EXCEED DW AND/OR GSI
- WELLS SAMPLED AND VOC'S DO NOT EXCEED DW CRITERIA
- APPROXIMATE EXTENT LNAPL
- EXTENT VOCs IN PERCHED ZONE> DW CRITERIA
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF VOC ANALYTICAL RESULTS - 2023

ARCADIS

FIGURE
5

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
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MW-18-98
2/16/2023: 140
5/23/2023: 250
11/2/2023: 180

MW-18-89
2/17/2023: 120
11/4/2023: 170

MW-18-90
2/16/2023: 880
11/3/2023: 1200J

MW-18-113: DRY

UNK-15
2/17/2023: 1100
5/24/2023: 940
11/4/2023: 1400

MW-18-97

MW-18-93
11/2/2023: 38

MW-02-04(3)

MW-18-99
2/16/2023: 56
5/23/2023: 57
11/3/2023: 69

MW-19-112

MW-18-88
2/16/2023: 150
5/24/2023: 200
11/3/2023: 320

MW-19-107
MW-18-101
MW-18-92
MW-19-108
MW-19-111

MW-91-2R

MW-23

MW-18-102
MW-18-103
MW-18-104
MW-18-105

MW-18-91
2/17/2023: 44
11/4/2023: 52

CH-14-RO
11/04/2023: 9800J

MW-18-94

MW-19-114

MW-18-100

MW-18-95
2/17/2023: 29
5/24/2023: 35
11/3/2023: 55

MW-20-132
10/31/2023: 19

MW-14-60
10/26/2023: 44

MW-12-12
2/16/2023: 36
5/24/2023: 22
11/1/2023: 36

MW-14-62
10/26/2023: 54

MW-22-151

MW-14-59

MW-12-10R

MW-22-152

MW-22-150

MW-04-05(6)

P6-SB-18
10/31/2023: 29

MW-04-06R

MW-14-66
10/31/2023: 200

MW-20-131

MW-12-11

MW-14-58R

MW-14-70

MW-14-61

P2-MW-04
10/25/2023: 31

MW-15-72

MW-12-13

MW-12-09

MW-14-67

MW-16-81

MW-22-149

MW-14-56

MW-20-130

MW-04-04R

MW-12-18

MW-21-140

MW-13-36R
2/14/2023: 44
5/24/2023: 37
10/31/2023: 47

MW-16-78

MW-22-148

P2-MW-02

P6-SB-07
2/15/2023: 110
11/1/2023: 62

MW-22-147

MW-21-133

MW-21-139
2/15/2023: 1000
5/16/2023: 1700
10/25/2023: 2100 J

MW-22-146

MW-21-134

MW-22-160

MW-21-135

MW-22-144

MW-22-145

MW-21-136

MW-22-143

MW-22-158

MW-22-159: DRY

MW-21-137

MW-21-138

NOTES:

APPROXIMATE EXTENT OF IMPACTS/PLUMES SHOWN ARE BASED ON SEVERAL INVESTIGATIONS PREVIOUSLY COMPLETED AT THE SITE.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

GSI: EGLE PART 201 GROUNDWATER SURFACE WATER INTERFACE CRITERION.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

J: COMPOUND WAS POSITIVELY IDENTIFIED, BUT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY

PFOS: PERFLUOROOCTANE SULFONIC ACID

ng/L: NANOGRAM PER LITER.

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- BEDROCK MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- PERCHED ZONE MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- WELLS SAMPLED AND PFOS EXCEEDS GSI CRITERIA (12ng/L) AND/OR DW CRITERIA (16 ng/L)
- WELLS SAMPLED AND PFOS DOES NOT EXCEED GSI OR DW CRITERIA
- PFOS IN PERCHED GROUNDWATER (>12 ng/L)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 500 1,000
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFOS ANALYTICAL RESULTS - 2023

ARCADIS

FIGURE 6

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\Processing_ENVIRACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report\2023 Annu

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing_ENVRACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report.aprx PLOTTED: 6/21/2024 7:05 AM BY: VDavis

MW-18-89
2/17/2023: 11
4/11/2023: 14

MW-18-90
2/16/2023: 16
11/3/2023: 17

UNK-15
2/17/2023: 30
5/24/2023: 26
11/4/2023: 24

MW-18-93
11/2/2023: 29

MW-18-88
2/16/2023: 6.1
5/24/2023: 6.8
11/3/2023: 9.7

MW-18-98
MW-18-97
MW-02-04(3)
MW-19-112
MW-18-99
MW-19-107
MW-18-101
MW-18-92
MW-19-108
MW-19-111
MW-91-2R
MW-23
MW-18-91
MW-18-94
CH-14-RO
11/4/2023: 100J
MW-18-95
MW-18-100
5/23/2023: 2.4J
11/3/2023: 8.3
MW-18-102
MW-18-103
MW-18-104
MW-18-105
MW-19-114
MW-20-132
5/23/2023: 13
10/31/2023: 50
MW-22-151
2/13/2023: 8.0
5/23/2023: 8.6
8/28/2023: 8.0
10/31/2023: 8.7
MW-12-10R
10/30/2023: 8.6
MW-04-06R
MW-20-131
5/23/2023: 32
10/31/2023: 45
MW-12-12
2/15/2023: 78
5/24/2023: 74
11/1/2023: 110
MW-22-152
MW-14-70
2/15/2023: 17
10/31/2023: 17
MW-22-150
MW-12-11
P6-SB-18
10/31/2023: 22
MW-14-59
10/25/2023: 15
MW-14-58R
10/24/2023: 16
MW-14-60
10/26/2023: 41
MW-04-05(6)
10/31/2023: 36
MW-12-13
2/15/2023: 4.9
5/24/2023: 5.0
10/31/2023: 14
P2-MW-04
10/25/2023: 23
MW-12-09
10/26/2023: 16
MW-15-72
MW-14-61
MW-14-66
10/31/2023: 50
MW-16-81
MW-20-130
MW-14-56
MW-04-04R
MW-22-149
MW-13-36R
2/14/2023: 71
5/24/2023: 63
10/31/2023: 73
MW-14-67
2/14/2023: 19
10/31/2023: 20
MW-12-18
MW-16-78
MW-21-140
MW-14-62
10/26/2023: 59
P2-MW-02
MW-22-148
MW-21-133
5/24/2023: 16
11/1/2023: 110
MW-21-139
2/15/2023: 79
5/16/2023: 91
10/25/2023: 100
P6-SB-07
2/15/2023: 1600
11/1/2023: 1400
MW-22-147
MW-22-146
MW-21-134
5/24/2023: 29
11/1/2023: 40
MW-21-135
5/24/2023: 47
11/1/2023: 63J
MW-22-160
MW-22-159: DRY
MW-22-143
MW-22-158
MW-21-136
MW-21-137
MW-21-138
MW-22-144
2/13/2023: 5.0
5/18/2023: 12
8/28/2023: 7.5
10/30/2023: 6.4
MW-22-145
2/13/2023: 11
5/18/2023: 32
8/28/2023: 19
10/30/2023: 19

N

0 500 1,000
SCALE IN FEET

NOTES:

APPROXIMATE EXTENT OF IMPACTS/PLUMES SHOWN ARE BASED ON SEVERAL INVESTIGATIONS PREVIOUSLY COMPLETED AT THE SITE.

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

GSI: EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA

J: COMPOUND WAS POSITIVELY IDENTIFIED, BUT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY

PFOA: PERFLUOROOCTANOIC ACID

ng/L: NANOGRAM PER LITER.

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

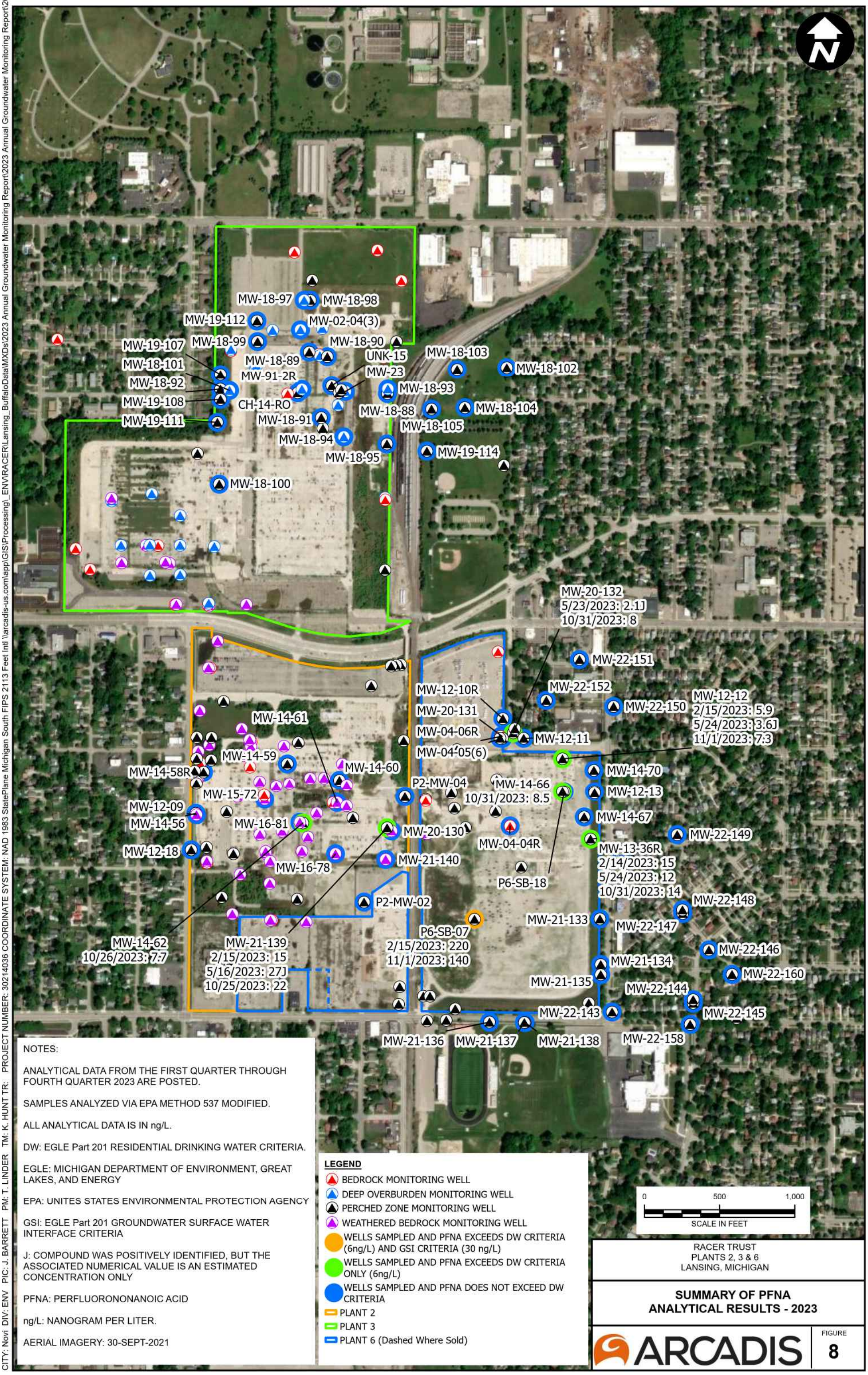
- BEDROCK MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- PERCHED ZONE MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- WELLS SAMPLED AND PFOA EXCEEDS DW CRITERIA (8 ng/L) AND GSI CRITERIA (170 ng/L)
- WELLS SAMPLED AND PFOA EXCEEDS DW CRITERIA ONLY (8 ng/L)
- WELL SAMPLED AND PFOA DOES NOT EXCEED DW CRITERIA
- PFOA IN PERCHED GROUNDWATER (> 8 ng/L)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFOA ANALYTICAL RESULTS - 2023

ARCADIS

FIGURE
7



NOTES:

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2023 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

EPA: UNITES STATES ENVIRONMENTAL PROTECTION AGENCY

GSI: EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA

J: COMPOUND WAS POSITIVELY IDENTIFIED, BUT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY

PFNA: PERFLUORONONANOIC ACID

ng/L: NANOGRAM PER LITER.

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- BEDROCK MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- PERCHED ZONE MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- WELLS SAMPLED AND PFNA EXCEEDS DW CRITERIA (6ng/L) AND GSI CRITERIA (30 ng/L)
- WELLS SAMPLED AND PFNA EXCEEDS DW CRITERIA ONLY (6ng/L)
- WELLS SAMPLED AND PFNA DOES NOT EXCEED DW CRITERIA
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFNA ANALYTICAL RESULTS - 2023

ARCADIS

FIGURE 8

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report\2023 Annu

P2-MH-2				
Date:	2/7/2023	4/25/2023	7/25/2023	10/24/2023
PFOS:	7.6	6.4	**17**	**18**
PFOA:	13	8.2	14	20
PFBS:	<4.0	1.5 J	2.9 J	2.2 J
PFHxS:	2.0 J	1.6 J	3.4 J	4.4
PFNA:	1.5 J	<3.9	1.9 J	2.9 J

P2-MH-W				
Date:	2/7/2023	4/25/2023	7/25/2023	10/24/2023
PFOS:	<3.8	1.7 J	<3.9	7.3 [3.9]
PFOA:	2.1 J	2.0 J	2.1 J	3.4 J [2.8 J]
PFBS:	1.5 J	1.1 J	<3.9	1.2 J [1.4 J]
PFHxS:	1.5 J	1.1 J	1.6 J	<3.9 [<3.8]
PFNA:	<3.8	<3.9	<3.9	2.5 J [2.4 J]

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-PFAS CONCENTRATIONS SHOWN IN ng/L

-BOLD/HIGHLIGHT = MANHOLE EXCEEDS SURFACE WATER CRITERIA

PFOS RULE 57 SURFACE WATER CRITERIA: 12 ng/L
PFOA RULE 57 SURFACE WATER CRITERIA: 170 ng/L
PFBS RULE 57 SURFACE WATER CRITERIA: 670,000 ng/L
PFHxS RULE 57 SURFACE WATER CRITERIA: 219ng/L
PFNA RULE 57 SURFACE WATER CRITERIA: 30 ng/L

PFAS: PERFLUOROOCTANOIC ACID
PFOS: PERFLUOROOCTANE SULFONIC ACID
PFOA: PERFLUOROOCTANOIC ACID
PFBS PERFLUOROBUTANE SULFONIC ACID
PFHxS: PERFLUOROHEXANESULFONIC ACID
PFNA: PERFLUORONONANOIC ACID
ng/L: NANOGRAMS PER LITER
J: CONSTITUENT IDENTIFIED BELOW SAMPLE

SAMPLES ANALYZED VIA EPA 537M – MI LIST OF 28

ADJUSTMENT TYPE
- FILLED STRUCTURE
- CAPPED STRUCTURE
- COULD NOT LOCATE STRUCTURE
- CATCH BASIN REMAINING OPEN

STRUCTURES & SAMPLE POINTS
- MANHOLE
- DRY MANHOLE

PLANT 2 DRAINAGE NETWORKS
- NORTHEAST (ABANDONED)
- CENTRAL (PARTIALLY ABANDONED)
- SOUTHWEST (ABANDONED)

OBSERVED FLOW (October 2023)
- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)
- MODERATE (~3 GPM OR GREATER)

PLANT BOUNDARIES
- PLANT 2
- PLANT 3
- PLANT 6

0 150 300
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 2 PFAS STORM SEWER SAMPLING ANALYTICAL RESULTS

ARCADIS

FIGURE 9

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 P2 P3 P6 Storm Sewer Modifications Completion Report\PFAS Sampling Figs\PFAS Sampling Figs.aprx PLOTTED: 3/25/2024 10:12 AM BY: VDavis

P3-MH-284				
Date:	2/7/2023	4/25/2023	7/25/2023	10/24/2023
PFOS:	3.1 J	5.9	5.1	7.0
PFOA:	1.4 J	2.1 J	<4.0	<3.9
PFBS:	1.6 J	2.3 J	<4.0	0.92 J
PFHxS:	<4.3	<3.9	<4.0	<3.9
PFNA:	<4.3	<3.9	<4.0	<3.9

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-PFAS CONCENTRATIONS SHOWN IN ng/L

-BOLD/HIGHLIGHT = MANHOLE EXCEEDS SURFACE WATER CRITERIA

PFOS SURFACE WATER CRITERIA: 12 ng/L
PFOA SURFACE WATER CRITERIA: 170 ng/L
PFBS SURFACE WATER CRITERIA: 670,000 ng/L
PFHxS SURFACE WATER CRITERIA: 219ng/L
PFNA SURFACE WATER CRITERIA: 30 ng/L

PFAS: PERFLUOROOCTANOIC ACID
PFOS: PERFLUOROOCTANE SULFONIC ACID
PFOA: PERFLUOROOCTANOIC ACID
PFBS PERFLUOROBUTANE SULFONIC ACID
PFHxS: PERFLUOROHEXANESULFONIC ACID
PFNA: PERFLUORONONANOIC ACID
ng/L: NANOGRAMS PER LITER
J: CONSTITUENT IDENTIFIED BELOW SAMPLE

SAMPLES ANALYZED VIA EPA 537M – MI LIST OF 28

P3-MH-284
P3-MH-290
Willow Street
P3-MH-NE
Western CLSM Monolith
Eastern CLSM Monolith
P3-MH-308
P3-MH-1-1
P3-MH-2-1N
P3-MH-2-1
P3-MH-2-2
P3-MH-1-7
P3-MH-1-10
P3-MH-1-9
P3-MH-2-5
Saginaw Street
Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

FILLED STRUCTURE
CAPPED STRUCTURE
CLSM MONOLITH
BULKHEAD
DISCHARGE OPEN WITH CUSTOM POUR

STRUCTURES & SAMPLE POINTS
MANHOLE
MANHOLE COULD NOT BE LOCATED
CATCH BASIN REMAINING OPEN
CATCH BASIN COULD NOT BE LOCATED

PLANT 3 DRAINAGE NETWORKS
COUNTY MAIN (ACTIVE)
EAST MAIN (ABANDONED)
WEST MAIN (ABANDONED)
OTHER (ACTIVE)

OBSERVED FLOW (October 2023)
NO FLOW
TRICKLE (~1 GPM OR LESS)
LITTLE (~1-3 GPM)
MODERATE (~3 GPM OR GREATER)

PLANT BOUNDARIES
PLANT 2
PLANT 3

0 200 400
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 3 PFAS STORM SEWER SAMPLING ANALYTICAL RESULTS

ARCADIS

FIGURE
10

CITY: NOVI DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30214038 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing\ ENV\RACER\Lansing\ BuffaloData\MXDs\2023 P2 P3 P6 Storm Sewer Modifications Completion Report\PFAS Sampling Figs\PFAS Sampling Figs.aprx PLOTTED: 3/25/2024 10:12 AM BY: VDavis

Osborn-MH-1_N	
Date:	10/24/2023
PFOS:	**18**
PFOA:	26
PFBS:	1.7 J
PFHxS:	1.9 J
PFNA:	5.2

Stanley-MH-1	
Date:	10/24/2023
PFOS:	**22**
PFOA:	30
PFBS:	<4.0
PFHxS:	2.0 J
PFNA:	4.9

Osborn-MH-1			
Date:	2/7/2023	4/25/2023	7/25/2023
PFOS:	**43 [45]**	**16 [16]**	**14 [14]**
PFOA:	43 [43]	26 [25]	27 [23]
PFBS:	<4.1 [<3.9]	1.4 J [1.6 J]	1.7 J [1.8 J]
PFHxS:	1.9 J [<3.9]	1.9 J [1.8 J]	2.1 J [2.3 J]
PFNA:	12 [13]	4.7 [4.5]	3.1 J [3.0 J]

Osborn-MH-1_E	
Date:	10/24/2023
PFOS:	**20**
PFOA:	25
PFBS:	<4.0
PFHxS:	2.1 J
PFNA:	5.4

Osborn-MH-3		
Date:	7/25/2023	10/24/2023
PFOS:	**52**	**14**
PFOA:	40	25
PFBS:	1.6 J	1.0 J
PFHxS:	2.1 J	1.1 J
PFNA:	8.4	2.3 J

Osborn-MH-1_SW			
Date:	4/25/2023	7/25/2023	10/24/2023
PFOS:	**25**	**47**	**27 [28]**
PFOA:	32	49	29 [31]
PFBS:	<3.7	2.2 J	<3.9 [<4.1]
PFHxS:	1.9 J	2.9 J	1.4 J [1.7 J]
PFNA:	7.4	14	6.2 [7.3]

Osborn-MH-1_SE		
Date:	4/25/2023	10/24/2023
PFOS:	**16**	**16**
PFOA:	16	12
PFBS:	1.5 J	1.1 J
PFHxS:	1.7 J	1.2 J
PFNA:	1.5 J	1.5 J

Osborn-MH-4_NE	
Date:	10/24/2023
PFOS:	**31**
PFOA:	14
PFBS:	1.2 J
PFHxS:	1.3 J
PFNA:	1.7 J

Osborn-MH-4	
Date:	10/24/2023
PFOS:	**17**
PFOA:	11
PFBS:	1.1 J
PFHxS:	1.1 J
PFNA:	1.4 J

Osborn-MH-4_E	
Date:	10/24/2023
PFOS:	10
PFOA:	9.5
PFBS:	1.0 J
PFHxS:	0.98 J
PFNA:	1.3 J

Osborn-MH-2_W	
Date:	10/24/2023
PFOS:	10
PFOA:	24
PFBS:	1.1 J
PFHxS:	1.1 J
PFNA:	2.1 J

Osborn-MH-2_SE	
Date:	10/24/2023
PFOS:	**15**
PFOA:	19
PFBS:	0.96 J
PFHxS:	0.81 J
PFNA:	2.7 J

Osborn-CB-2			
Date:	4/25/2023	7/25/2023	10/24/2023
PFOS:	**15**	**23**	**16**
PFOA:	26	26	19
PFBS:	1.0 J	1.4 J	1.0 J
PFHxS:	1.2 J	1.8 J	0.95 J
PFNA:	3.7 J	4.2	2.7 J

MichAve-MH-3				
Date:	2/7/2023	4/25/2023	7/25/2023	10/24/2023
PFOS:	3.3 J	2.4 J	4.9	3.7 J
PFOA:	3.9 J	4.4	5.9	4.5
PFBS:	<4.2	3.7 J	<4.1	2.5 J
PFHxS:	<4.2	4.0	5.1	2.6 J
PFNA:	<4.2	<4.0	<4.1	<4.0

Verlinden-MH-5				
Date:	2/7/2023	4/25/2023	7/25/2023	10/24/2023
PFOS:	5.4	**13**	11	**13**
PFOA:	28	31	26	39
PFBS:	2.9 J	4.0	4.1	2.8 J
PFHxS:	1.4 J	1.4 J	2.1 J	1.3 J
PFNA:	2.1 J	3.2 J	3.0 J	4.0 J

Stanley-MH-1
Osborn-MH-1
Osborn-MH-3
Osborn-MH-2
OSBORN ROAD
Outfall-013
Osborn-MH-4
Osborn-CB-2
P6-MH-13
Verlinden-MH-1
Verlinden-MH-2
P6-MH-14
N VERLINDEN AVENUE
Verlinden-MH-3
Verlinden-MH-4
Verlinden-MH-5
ESC-2
MichAve-MH-3
W MICHIGAN AVENUE

NOTES:
-UTILITY LOCATIONS ARE APPROXIMATE
-ARROWS DENOTE FLOW DIRECTION
-INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING
-AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC
-PFAS CONCENTRATIONS SHOWN IN ng/L

-BOLD/HIGHLIGHT = MANHOLE EXCEEDS SURFACE WATER CRITERIA

PFOS RULE 57 SURFACE WATER CRITERIA: 12 ng/L
PFOA RULE 57 SURFACE WATER CRITERIA: 170 ng/L
PFBS RULE 57 SURFACE WATER CRITERIA: 670,000 ng/L
PFHxS RULE 57 SURFACE WATER CRITERIA: 219ng/L
PFNA RULE 57 SURFACE WATER CRITERIA: 30 ng/L

PFAS: PERFLUOROOCTANOIC ACID
PFOS: PERFLUOROOCTANE SULFONIC ACID
PFOA: PERFLUOROOCTANOIC ACID
PFBS PERFLUOROBUTANE SULFONIC ACID
PFHxS: PERFLUOROHEXANESULFONIC ACID
PFNA: PERFLUORONONANOIC ACID
ng/L: NANOGRAMS PER LITER
J: CONSTITUENT IDENTIFIED BELOW SAMPLE

SAMPLES ANALYZED VIA EPA 537M – MI LIST OF 28

BULKHEAD
FILLED STRUCTURE
CAPPED STRUCTURE

STRUCTURES & SAMPLE POINTS
MANHOLE
MANHOLE COULD NOT BE LOCATED
CATCH BASIN REMAINING OPEN
DRY MANHOLE

PLANT BOUNDARIES
PLANT 2
PLANT 6

PLANT 6 DRAINAGE NETWORKS
STORM LINE
SANITARY LINE

OBSERVED FLOW (October 2023)
NO FLOW
TRICKLE (~1 GPM OR LESS)
LITTLE (~1-3 GPM)
MODERATE (~3 GPM OR GREATER)
SEWER LINE CUT AND CAPPED AT PROPERTY LINE DURING 2014 DEMOLITION

0 150 300
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

PLANT 6 PFAS STORM SEWER SAMPLING ANALYTICAL RESULTS

ARCADIS

FIGURE
11

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 P2 P3 P6 Storm Sewer Modifications Completion Report\PFAS Sampling Figs\PFAS Sampling Figs.aprx PLOTTED: 3/25/2024 10:12 AM BY: VDavis

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl PLOTTED: 6/21/2024
\\arcadis-us.com\app\GIS\Processing_ENVRACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report.aprx

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN MAY 15 THROUGH 16, 2023
AND WERE COLLECTED FROM THE TOP OF THE WELL CASING
2. WELL LABELING:
WELL NAME
WELL SCREEN (FT BGS)
GROUNDWATER ELEVATION (FT AMSL)
3. * = LNAPL MONITORING WELLS CORRECTED FOR PRESENCE OF LNAPL
4. **MONITORING WELL NOT UTILIZED IN CONTOURING CALCULATIONS. GROUNDWATER CONTOURS ONLY CONSIDER MONITORING WELLS INSTALLED < 27 FEET BELOW GRADE

BGS: BELOW GROUND SURFACE
FT: FEET
LNAPL: LIGHT NON-AQUEOUS PHASE LIQUID
AMSL: ABOVE MEAN SEA LEVEL

AERIAL IMAGERY: 30-SEPT-2021

LEGEND
- PERCHED ZONE MONITORING
- LNAPL MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- INFERRED GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

PERCHED POTENTIOMETRIC SURFACE CONTOUR MAP - PLANTS 2 & 6 MAY 15-16, 2023

ARCADIS

FIGURE 12

0 250 500
SCALE IN FEET

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: T. Linder TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\

MW-18-113: DRY

MW-18-98
7-12
856.7

MW-19-112
9-14
855.41

MW-18-99
9-14
858.57

MW-18-89
7-12
859.27

MW-18-90
15-20
856.81

P3-SB-07
11-16
858.9

MW-19-107
23-28
853.73

MW-18-92
23-28
855.61

LMW-12-09
3-8
859.62

MW-05(3)
10-15
858.96

UNK-15
11-16
859.13

UNK-11
6.5-11.5
859.10

MW-18-88
6-11
858.54

CH-14-RO
7-12
858.86

UNK-10
11-16
859.01

MW-19-108
23-28
857.62

MW-18-91
7-12
859.83

MW-19-111
20-25
852.27

P3-SB-28
8-13
860.29

LMW-12-10
14-19
854.77

MW-18-95
4.5-9.5
857.83

MW-14-65
5-10
859.39

LMW-12-11
15-20
855.39

MW-18-100
8-13
853.62

MW-13-31
5-10
853.79

MW-13-32
5-10
853.83

MW-18-103
5-10
856.71

MW-18-102
10-15
854.82

MW-18-105
6-11
857.28

MW-18-104
5-10
856.61

MW-19-114
6-11
857.91

MW-18-106
5-10
862.80

855 856 857 858 859 860 861 862

LEGEND

- PERCHED ZONE MONITORING WELL
- LNAPL MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- INFERRED GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- MUNICIPAL SANITARY
- SANITARY LINE
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN MAY 2023 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

2. WELL LABELING:
WELL NAME
GROUNDWATER ELEVATION (FT AMSL)

3. * = LNAPL MONITORING WELLS CORRECTED FOR PRESENCE OF LNAPL

4. **MONITORING WELL NOT UTILIZED IN CONTOURING CALCULATIONS. GROUNDWATER CONTOURS ONLY CONSIDER MONITORING WELLS INSTALLED < 27 FEET BELOW GRADE

BGS: BELOW GROUND SURFACE
FT: FEET
NS: NOT SURVEYED
LNAPL: LIGHT NON-AQUEOUS PHASE LIQUID
AMSL: ABOVE MEAN SEA LEVEL

AERIAL IMAGERY: 30-SEPT-2021

0 240 480
SCALE IN FEET

RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

PERCHED POTENTIOMETRIC SURFACE CONTOUR MAP - PLANT 3 MAY 15-16, 2023

ARCADIS

FIGURE 13

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GI

MW-18-97
85-90
799.4

MW-02-03(3)
79-89
800.42

MW-13-40
72-77
807.43

MW-02-04(3)
76-86
800.06

MW-04-03(3)
80-90
799.86

MW-13-41
77-82
808.66

MW-02-02(3)**
74-84
801.96

MW-93-1
65-75
803.31

MW-18-101
80-85
801.93

MW-91-2R
75-80
809.69

MW-23
52-62
814.93

MW-18-93
77.5-82.5
815.55

MW-22
52.5-62.5
814.23

MW-18-94
72-77
813.29

MW-02-01(3)
59-69
814.73

MW-13-26
72-77
800.56

MW-12-20
75-80
799.53

MW-13-30
72-77
799.32

MW-13-24
69-74
800.77

MW-12-21
70-75
800.29

MW-13-23
69-74
799.76

MW-13-27
67-72
799.79

MW-13-25
67-72
799.44

MW-13-29*
68-73
829.01

MW-13-48
65-70
798.94

800 802 804 806 808 810 812 814 799

LEGEND

- DEEP OVERBURDEN MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- INFERRED GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN MAY 2023 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

2. WELL LABELING:
WELL NAME
WELL SCREEN
GROUNDWATER ELEVATION (FT AMSL)

3. **MONITORING WELL NOT UTILIZED IN CONTOURING CALCULATIONS.

4. *MW-13-29 NOT USED IN CONTOUR CALCULATONS DUE TO POTENTIAL EFFECT FROM ONGOING SPARGING ACTIVITIES.

BGS: BELOW GROUND SURFACE
FT: FEET
AMSL: ABOVE MEAN SEA LEVEL

AERIAL IMAGERY: 30-SEPT-2021

0 260 520
SCALE IN FEET

RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

**DEEP OVERBURDEN POTENTIOMETRIC SURFACE CONTOUR MAP - PLANT 3
MAY 15-16, 2023**

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FIGURE
14

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitor

MW-13-39B
97-112
798.09/792.87

MW-91-4
116-132.5
798.64/798.64*

MW-88-1(B)
103.5-140
795.13/795.13

MW-12-04
77-100
797.40/797.40*

MW-04-02(3)
126-136
799.23/799.23*

MW-13-38
107-124
797.78/794.11

MW-91-3
105-117
795.79/792.08

GRAND RIVER FORMATION

MW-13-37
97-112
797.97/790.59

SAGINAW FORMATION

MW-13-37
NM

MW-91-5
112.5-128
799.02/799.02*

MW-13-28
99-115.5
796.53/796.53*

MW-91-6
82-98
791.25/791.25*

MW-13-47
99-119
790.22/790.22*

MW-12-02
NM

MW-12-03
57-80
796.97/779.85

MW-13-44
96-115
787.58/781.45

MW-19-125
100-115
787.40/781.56

MW-17-87
100-112
787.67/781.91

MW-12-05R
100-112
789.08/782.69

MW-12-06
80.6-99.5
792.04/780.49

MW-04-06R
74-99.5
796.21/784.59

MW-04-01(6)
78-88
796.63/780.87

MW-04-04R
82-110
797.40/784.84

MW-12-01
87-110
789.92/779.94

MW-13-50
85-107
790.68/778.36

799 797 795 793 791 789 787 785 783 781 779

NOTES:

MONITORING WELLS LOCATED IN THE SAGINAW FORMATION ARE CORRECTED FOR AN AVERAGE
VERTICAL GRADIENT OF 0.34 (FT/FT DOWNWARD)

* MONITORING WELLS LOCATED IN GRAND RIVER FORMATION NOT CORRECTED FOR VERTICAL GRADIENT

APPROXIMATE EXTENT OF IMPACTS/PLUMES SHOWN ARE BASED ON SEVERAL INVESTIGATIONS PREVIOUSLY COMPLETED AT THE SITE

(B) - BASELINE WELL (DEEPEST WELL)

793.41/789.50 - UNCORRECTED GW ELEV / CORRECTED GW ELEV

DEPTH TO WATER MEASUREMENTS WERE TAKEN MAY 15-16, 2023 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

ELEVATION IS GIVEN IN FEET ABOVE MEAN SEA LEVEL (FT AMSL)

DW: DRINKING WATER
ELEV: ELEVATION
FT: FEET
GW: GROUNDWATER
NU: GROUNDWATER ELEVATION NOT USED IN CONTOUR MAP CREATION. WELL MW-04-01(3) HAS HISTORICALLY MEASURED HIGH RELATIVE TO OTHER BEDROCK WELLS
NM: NOT MEASURED
µg/L: MICROGRAMS PER LITER

LEGEND

- WEATHERED BEDROCK/BEDROCK MONITORING WELL
- APPROXIMATE LOCATION OF GRAND RIVER/SAGINAW FORMATION GEOLOGIC CONTACT
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- INFERRED GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- LOWER 1,4-DIOXANE PLUME > 72 ug/L
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

BEDROCK POTENTIOMETRIC SURFACE CONTOUR MAP MAY 15-16, 2023

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FIGURE 15

MW-18-98
PFNA: Increasing trend
PFOA: Decreasing trend
PFOS: No trend

MW-18-103
PFHxS: Increasing trend

MW-19-112
MW-18-89
MW-18-90
MW-18-99
MW-91-2R
MW-19-107
MW-18-92
MW-19-108
MW-19-111
CH-14-RO
UNK-15
MW-18-91
MW-18-95
MW-18-100
MW-18-102
MW-18-104
MW-18-105
MW-19-114
MW-18-88
PFOA: Increasing trend
PFOS: Increasing trend

MW-14-60
1,4-D: Decreasing trend
PFOA: Increasing trend
PFOS: No trend
VC: Increasing trend
MW-23-162
MW-23-161
MW-23-163
MW-22-155
MW-14-58R
MW-22-153
MW-22-157
MW-22-156
MW-13-44
MW-14-59
P2-MW-04
MW-12-09
PFOA: Increasing trend
MW-14-57
MW-14-62
MW-21-139
MW-12-18
P2-MW-02
P6-SB-07

MW-22-151
MW-22-152
MW-22-150
MW-12-10R
MW-20-132
MW-04-05(6)
MW-22-154
MW-12-11
MW-20-131
MW-12-12
P6-SB-18
MW-14-70
MW-03-05
MW-14-66
MW-12-13
MW-03-06
MW-02-02(6)
MW-13-36R
MW-22-149
MW-14-67
PFOA: Increasing trend
MW-22-148
MW-21-133
MW-22-147
MW-22-146
MW-21-134
MW-21-135
MW-22-160
MW-22-144
MW-22-145
MW-22-143
MW-22-158
MW-21-136
MW-21-137
MW-21-138

NOTES:

MANN-KENDALL TREND ANALYSIS CONDUCTED WHEN AT LEAST SEVEN SAMPLES, 50% DETECTED VALUES, AND 25% EXCEEDANCES ARE AVAILABLE. SIGNIFICANCE OF TRENDS EVALUATED AT 90% CONFIDENCE.

- ALL DATA COLLECTED THROUGH DECEMBER 2023 IS SHOWN.
- ANALYTICAL DATA COMPARED AGAINST EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA AND/OR EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA DURING TREND ANALYSIS REVIEW.

ANALYTICAL DATA AVAILABLE IN TABLE 2A. TREND RESULTS SUMMARIZED IN TABLE 6.

1,4-D: 1,4-DIOXANE
DW: DRINKING WATER
EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
GSI: GROUNDWATER SURFACE WATER INTERFACE
LNAPL: LIGHT NON-AQUEOUS PHASE LIQUID
PFAS: PERFLUOROOCTANOIC ACID
PFHxS: PERFLUOROHEXANESULFONIC ACID
PFOA: PERFLUOROOCTANOIC ACID
PFOS: PERFLUOROOCTANE SULFONIC ACID
VC: VINYL CHLORIDE
VOCs: VOLATILE ORGANIC COMPOUNDS
µg/L: MICROGRAMS PER LITER

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- INCREASING TREND OBSERVED
- DECREASING, STABLE, OR NO SIGNIFICANT TREND OBSERVED
- DOES NOT MEET CRITERIA FOR TREND ANALYSIS
- APPROXIMATE LNAPL EXTENT
- APPROXIMATE EXTENT FORMER ADAMS PLATING CO. LOWER 1,4-DIOXANE PLUME > DW CRITERIA (7.2 ug/L)
- VOCs IN PERCHED GROUNDWATER > DW AND/OR GSI CRITERIA (FOR INDIVIDUALLY REGULATED COMPOUNDS)
- PFOS IN PERCHED GROUNDWATER > DW (16 ng/L) AND/OR GSI (12 ng/L) CRITERIA
- PFOA IN PERCHED GROUNDWATER (> 8 ng/L)
- 1,4-DIOXANE IN PERCHED GROUNDWATER > DW CRITERIA (7.2 ug/L)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 500 1,000
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF VOC; 1,4-DIOXANE; AND PFAS TRENDS IN PERCHED GROUNDWATER - 2023

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FIGURE 16

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
\\arcadis-us.com\app\GIS\Processing_ENV\RACER\Lansing_Buffalo\Data\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitoring Report.aprx PLOTTED: 6/21/2024 7:05 AM BY: VDavis

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. BARRETT PM: T. LINDER TM: K. HUNT TR: PROJECT NUMBER: 30214036 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl \\arcadis-us.com\app\GIS\Processing_ENVRACER\Lansing_BuffaloData\MXDs\2023 Annual Groundwater Monitoring Report\2023 Annual Groundwater Monitori

TWP-90-05
TWP-90-04
TWP-90-03
MW-19-119S/D
MW-13-26
MW-13-28
MW-12-21
MW-13-30
MW-13-22
MW-13-23
MW-13-27
TW-14-06
TW-15-11
PW-14-03R
MW-13-25
MW-13-29
MW-13-48
MW-13-46
MW-13-34
MW-21-142
MW-14-63
MW-20-126
MW-16-80
TW-15-12
MW-13-44
PW-14-02
MW-13-43
MW-13-45
MW-20-128
MW-20-127
MW-16-85
MW-19-118S/D
MW-19-125
MW-16-84
MW-17-87
MW-19-116
MW-16-82
MW-17-86
MW-12-06
MW-19-115
MW-14-61
MW-19-117
MW-12-05R
MW-19-120
MW-14-56
MW-15-72
MW-19-124
MW-20-130
MW-16-81
MW-20-129
MW-19-121
MW-21-141
TW-14-02
PW-14-01
MW-16-78
MW-21-140
MW-16-76
MW-19-123
MW-16-77
MW-16-74
MW-16-75
MW-19-122

NOTES:

MANN-KENDALL TREND ANALYSIS CONDUCTED WHEN AT LEAST SEVEN SAMPLES, 50% DETECTED VALUES, AND 25% EXCEEDANCES ARE AVAILABLE. SIGNIFICANCE OF TRENDS EVALUATED AT 90% CONFIDENCE.

ALL DATA COLLECTED THROUGH DECEMBER 2023 IS SHOWN.

ANALYTICAL DATA COMPARED AGAINST EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA DURING TREND ANALYSIS REVIEW.

ANALYTICAL DATA AVAILABLE IN TABLE 2A. TREND RESULTS SUMMARIZED IN TABLE 6.

DW: DRINKING WATER
EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
µg/L: MICROGRAMS PER LITER

AERIAL IMAGERY: 30-SEPT-2021

LEGEND

- INCREASING TREND OBSERVED
- DECREASING, STABLE, OR NO SIGNIFICANT TREND OBSERVED
- DOES NOT MEET CRITERIA FOR TREND ANALYSIS
- 1,4-DIOXANE IN LOWER GROUNDWATER > DW CRITERIA (7.2 ug/L)
- PLANT 2
- PLANT 3
- PLANT 6 (Dashed Where Sold)

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE TRENDS IN DEEP OVERBURDEN AND WEATHERED BEDROCK - 2023

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FIGURE 17

Appendix A

Lansing Township Municipal Well Sampling Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Tiffany Linder
ARCADIS US Inc
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Generated 11/18/2023 6:52:30 AM

JOB DESCRIPTION

Racer Lansing

JOB NUMBER

240-194285-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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Authorized for release by
Michael DelMonico, Project Manager I
Michael.DelMonico@et.eurofinsus.com
(330)497-9396

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Definitions/Glossary

Client: ARCADIS US Inc
Job ID: 240-194285-1
Project/Site: Racer Lansing

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-194285-1

Laboratory: Eurofins Cleveland

Narrative

Job Narrative
240-194285-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/26/2023 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.0°C

GC/MS Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Method Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Method	Method Description	Protocol	Laboratory
522	1,4 Dioxane (GC/MS SIM)	EPA	EET BUR
522	Solid-Phase Extraction (SPE)	EPA	EET BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-194285-1	TWP-90-04_102523	Water	10/25/23 08:35	10/26/23 09:50
240-194285-2	TWP-90-05_102523	Water	10/25/23 08:55	10/26/23 09:50
240-194285-3	FB-01_102523	Water	10/25/23 09:10	10/26/23 09:50
240-194285-4	TWP-90-03_102523	Water	10/25/23 09:15	10/26/23 09:50
240-194285-5	DUP-01_102523	Water	10/25/23 00:00	10/26/23 09:50

Detection Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-04_102523 — Lab Sample ID: 240-194285-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.24		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: TWP-90-05_102523 — Lab Sample ID: 240-194285-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.36		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: FB-01_102523 — Lab Sample ID: 240-194285-3

No Detections.

Client Sample ID: TWP-90-03_102523 — Lab Sample ID: 240-194285-4

No Detections.

Client Sample ID: DUP-01_102523 — Lab Sample ID: 240-194285-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.30		0.20	0.092	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-04_102523
Date Collected: 10/25/23 08:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.24		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*83*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:07*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-05_102523
Date Collected: 10/25/23 08:55
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.36		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*81*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:20*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: FB-01_102523
Date Collected: 10/25/23 09:10
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*82*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:34*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-03_102523
Date Collected: 10/25/23 09:15
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-4
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:47*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: DUP-01_102523
Date Collected: 10/25/23 00:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-5
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.30		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 02:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/10/23 13:45*	*11/17/23 02:01*	*1*

Surrogate Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
		DXE							
Lab Sample ID	Client Sample ID	(46-130)							
240-194285-1	TWP-90-04_102523	83							
240-194285-2	TWP-90-05_102523	81							
240-194285-3	FB-01_102523	82							
240-194285-4	TWP-90-03_102523	86							
240-194285-5	DUP-01_102523	86							
LCS 200-197364/2-A	Lab Control Sample	79							
MB 200-197364/1-A	Method Blank	85							

Surrogate Legend

DXE = 1,4-Dioxane-d8 (Surr)

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Lab Sample ID: MB 200-197364/1-A
Matrix: Water
Analysis Batch: 197594

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197364

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/10/23 13:45	11/16/23 23:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*85*		*46 - 130*	*11/10/23 13:45*	*11/16/23 23:32*	*1*

Lab Sample ID: LCS 200-197364/2-A
Matrix: Water
Analysis Batch: 197594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197364

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
1,4-Dioxane			2.00	1.71		ug/L		86	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*79*		*46 - 130*

QC Association Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

GC/MS Semi VOA

Prep Batch: 197364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194285-1	TWP-90-04_102523	Total/NA	Water	522	
240-194285-2	TWP-90-05_102523	Total/NA	Water	522	
240-194285-3	FB-01_102523	Total/NA	Water	522	
240-194285-4	TWP-90-03_102523	Total/NA	Water	522	
240-194285-5	DUP-01_102523	Total/NA	Water	522	
MB 200-197364/1-A	Method Blank	Total/NA	Water	522	
LCS 200-197364/2-A	Lab Control Sample	Total/NA	Water	522	

Analysis Batch: 197594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194285-1	TWP-90-04_102523	Total/NA	Water	522	197364
240-194285-2	TWP-90-05_102523	Total/NA	Water	522	197364
240-194285-3	FB-01_102523	Total/NA	Water	522	197364
240-194285-4	TWP-90-03_102523	Total/NA	Water	522	197364
240-194285-5	DUP-01_102523	Total/NA	Water	522	197364
MB 200-197364/1-A	Method Blank	Total/NA	Water	522	197364
LCS 200-197364/2-A	Lab Control Sample	Total/NA	Water	522	197364

Lab Chronicle

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-04_102523
Lab Sample ID: 240-194285-1
Date Collected: 10/25/23 08:35
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197364	DO	EET BUR	11/10/23 13:45
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 01:07

Client Sample ID: TWP-90-05_102523
Lab Sample ID: 240-194285-2
Date Collected: 10/25/23 08:55
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197364	DO	EET BUR	11/10/23 13:45
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 01:20

Client Sample ID: FB-01_102523
Lab Sample ID: 240-194285-3
Date Collected: 10/25/23 09:10
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197364	DO	EET BUR	11/10/23 13:45
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 01:34

Client Sample ID: TWP-90-03_102523
Lab Sample ID: 240-194285-4
Date Collected: 10/25/23 09:15
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197364	DO	EET BUR	11/10/23 13:45
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 01:47

Client Sample ID: DUP-01_102523
Lab Sample ID: 240-194285-5
Date Collected: 10/25/23 00:00
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197364	DO	EET BUR	11/10/23 13:45
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 02:01

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS US Inc
Job ID: 240-194285-1
Project/Site: Racer Lansing

Laboratory: Eurofins Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-26
Connecticut	State	PH-0751	09-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-18-24
Florida	NELAP	E87467	06-30-24
Minnesota	NELAP	050-999-436	12-31-23
New Hampshire	NELAP	2006	12-18-23
New Jersey	NELAP	VT972	06-30-24
New York	NELAP	10391	03-31-24
Pennsylvania	NELAP	68-00489	04-30-24
Rhode Island	State	LAO00298	12-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
Vermont	State	VT4000	02-10-24
Virginia	NELAP	460209	12-14-23
Wisconsin	State	399140830	08-31-24

Eurofins Canton
180 S. Van Buren Ave

Barberton, OH 44203-3543
phone 330.497.9396 fax 330.497.0772

Chain of Custody Record

2.2
2.0

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Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Eurofins Environment Testing America

Client Contact	**Project Manager:**	COC No:
Arcadis	Email: tiffany.linder@arcadis.com	**Site Contact: Kaitlyn Hunt**	**Date:**	___1___ of ___1___ COCs
28550 Cabot Drive, Suite 500	**Tel/Fax: (810) 225-1928**	**Lab Contact: Michael DelMonico**	**Carrier:**	TALS Project #:
Novi, MI 48377	**Analysis Turnaround Time**			Sampler:
(248) 994-2240 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
tiffany.linder@arcadis.com, kaitlyn.hunt@arcadis.com	TAT if different from Below Standard			Walk-in Client:
Project Name: RACER Lansing/ 30171056.0470A	☐ 2 weeks			Lab Sampling:
Site: Plant ____ MUNICIPAL	☐ 1 week			Job / SDG No.:
P O #	☐ 2 days ☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	522 - 1,4-Dioxane	Sample Specific Notes:
TWP-90-04_102523	10/25/23	835	G	GW		N	N	X	
TWP-90-05_102523	10/25/23	855	G	GW		N	N	X	
FB-01_102523	10/26/23	910	G	GW		N	N	X	
TWP-90-03_102523	10/25/23	915	G	GW		N	N	X	
DUP-01_102523	10/25/23	—	G	GW		N	N	X	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

	Company	Date/Time		Company	Date/Time
Relinquished by:	ARCADIS	10/26/23 16:00	Received by:	EETNC	10/26/23 950
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Eurofins – Cleveland Sample Receipt Form/Narrative Login # : 194285
Barberton Facility

Client Arcadis Site Name

Cooler unpacked by: L Osborne

Cooler Received on 10/26/23 Opened on 10/26/23

FedEx: 1st Grd (Exp) UPS FAS Waypoint Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # EC ~~Foam~~ Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN # 21 (CF -0.2 °C) Observed Cooler Temp. 2.2 °C Corrected Cooler Temp. 2.0 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	
3. Shippers' packing slip attached to the cooler(s)?	(Yes) No	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC316719
14. Were VOAs on the COC?	Yes (No)	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes No (NA)	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes (No)	
17. Was a LL Hg or Me Hg trip blank present?	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

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240-194285 Chain of Custody

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	COC No: 240-175830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Michael.DelMonico@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):	Job #: 240-194285-1
Address: 530 Community Drive, Suite 11,	Due Date Requested: 11/13/2023		
City: South Burlington	TAT Requested (days):		
State, Zip: VT, 05403			
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:		
Email:	WO #:		
Project Name: Racer Lansing B0064480.2016.00603	Project #: 24017406		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

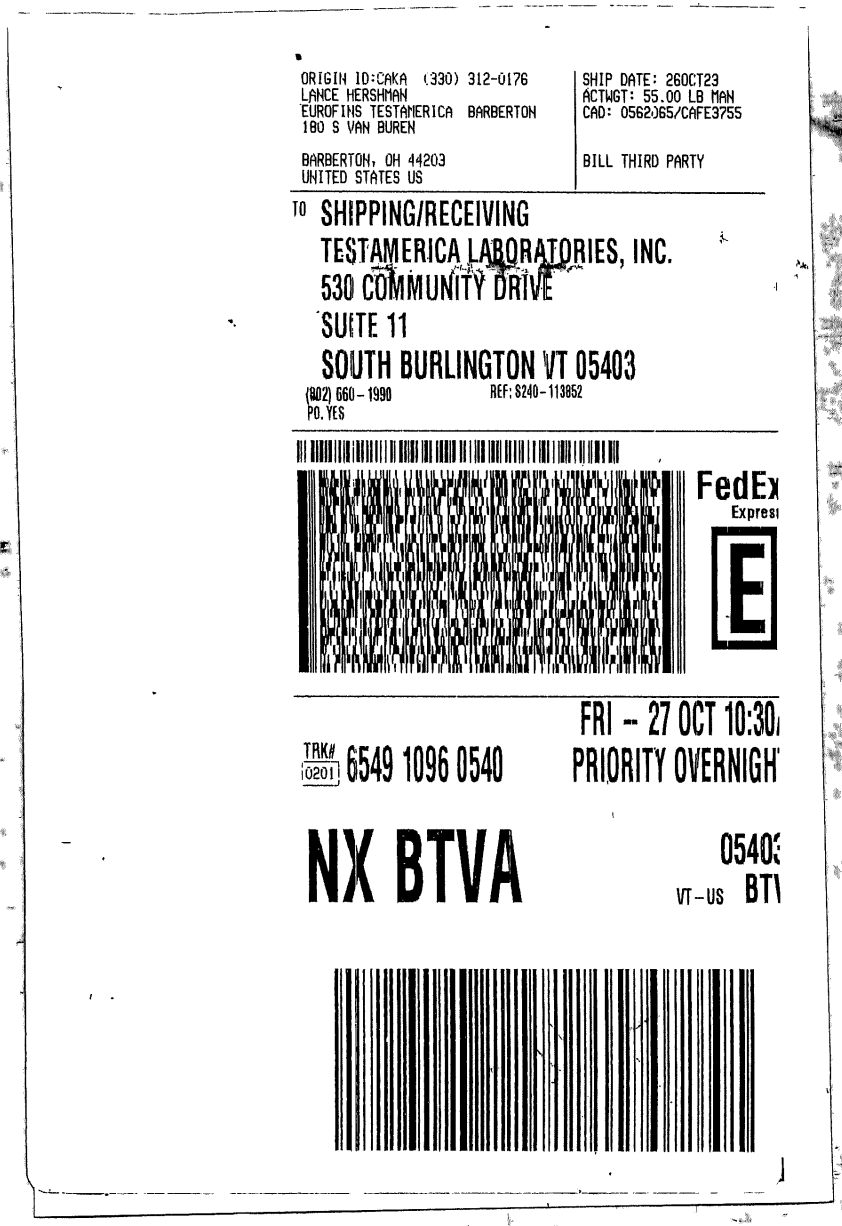
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
TWP-90-04_102523 (240-194285-1)	10/25/23	08:35 Eastern		Water			X	1	
TWP-690-05_102523 (240-194285-2)	10/25/23	08:55 Eastern		Water			X	1	
FB-01_102523 (240-194285-3)	10/25/23	09:10 Eastern		Water			X	1	
TWP-90-03_102523 (240-194285-4)	10/25/23	09:15 Eastern		Water			X	1	
DUP-01_102523 (240-194285-5)	10/25/23	Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: [signature]	Date/Time: 10/26/23 1530	Company: EETNC	Received by: [signature] Date/Time: 10/27/23 1030 Company: ETA Burl
Relinquished by:	Date/Time:	Company:	Received by: Date/Time: Company:
Relinquished by:	Date/Time:	Company:	Received by: Date/Time: Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:
	Cooler Temperature(s) °C and Other Remarks:



ORIGIN ID:CAKA (330) 312-0176
LANCE HERSHMAN
EUROFINS TESTAMERICA BARBERTON
180 S VAN BUREN

BARBERTON, OH 44203
UNITED STATES US

SHIP DATE: 26OCT23
ACTWGT: 55.00 LB MAN
CAD: 0562065/CAFE3755

BILL THIRD PARTY

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
530 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON VT 05403

(802) 660-1990
PO: YES

REF: 8240-113852

FedEx
Expres

FRI - 27 OCT 10:30
PRIORITY OVERNIGH

TRK# 0201 6549 1096 0540

NX BTVA

05403
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 240-194285-1

Login Number: 194285
List Number: 2
Creator: Muniz, Luca

List Source: Eurofins Burlington
List Creation: 10/27/23 02:18 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	Seals on cooler but date and time not filled out.
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.7ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B-1

Monitoring Well Sampling Laboratory Analytical Reports

Analytical Laboratory Report

Report ID: S45348.01(01)+QC01
Generated on 02/17/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S45348.01-S45348.05
Project: Racer Lansing 30171056.0470A
Collected Date(s): 02/13/2023 - 02/14/2023
Submitted Date/Time: 02/15/2023 09:20
Sampled by: Billy Cobern
P.O. #: 30171056

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S45348.01	MW-22-154_021323	Groundwater	02/13/23 12:55
S45348.02	MW-20-132_021423	Groundwater	02/14/23 15:20
S45348.03	MW-20-131_021423	Groundwater	02/14/23 16:20
S45348.04	DUP-06_021423	Groundwater	02/14/23 00:01
S45348.05	Trip Blank	Water	02/13/23 00:01

Lab Sample ID: S45348.01
Sample Tag: MW-22-154_021323
Collected Date/Time: 02/13/2023 12:55
Matrix: Groundwater
COC Reference: 152332

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/16/23 10:37	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/16/23 14:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45348.01 (continued)
Sample Tag: MW-22-154_021323

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/16/23 14:30, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45348.02
Sample Tag: MW-20-132_021423
Collected Date/Time: 02/14/2023 15:20
Matrix: Groundwater
COC Reference: 152332

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/16/23 10:37	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 21:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	3	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	6	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45348.02 (continued)
Sample Tag: MW-20-132_021423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 21:20, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45348.03
Sample Tag: MW-20-131_021423
Collected Date/Time: 02/14/2023 16:20
Matrix: Groundwater
COC Reference: 152332

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/16/23 10:37	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 21:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	3	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	2	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45348.03 (continued)
Sample Tag: MW-20-131_021423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 21:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45348.04
Sample Tag: DUP-06_021423
Collected Date/Time: 02/14/2023 00:01
Matrix: Groundwater
COC Reference: 152332

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/16/23 10:37	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 22:07, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	2	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45348.04 (continued)
Sample Tag: DUP-06_021423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 22:07, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45348.05
Sample Tag: Trip Blank
Collected Date/Time: 02/13/2023 00:01
Matrix: Water
COC Reference: 152332

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	8.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/16/23 10:37	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 22:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45348.05 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/15/23 22:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S45348.01(01)+QC01
Generated on 02/17/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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Report Summary

Lab Sample ID(s): S45348.01-S45348.05
Project: Racer Lansing 30171056.0470A
Submitted Date/Time: 02/15/2023 09:20
Sampled by: Billy Cobern
P.O. #: 30171056

QC Report Sections

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Analysis Summary (Pages 17-21)
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Surrogates per QC Sample (Pages 28-29)
Internal Standards per Lab Sample (Pages 30-34)
Internal Standards per QC Sample (Pages 35-36)
Batch QC Results (Pages 37-46)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S45348.01
Sample Tag: MW-22-154_021323
Collected Date/Time: 02/13/2023 12:55
Matrix: Groundwater
COC Reference: 152332

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/16/23 14:30	230216A9	VF230216W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45348.02
Sample Tag: MW-20-132_021423
Collected Date/Time: 02/14/2023 15:20
Matrix: Groundwater
COC Reference: 152332

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 21:20	230215A7	VF230215W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S45348.03
Sample Tag: MW-20-131_021423
Collected Date/Time: 02/14/2023 16:20
Matrix: Groundwater
COC Reference: 152332

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 21:43	230215A7	VF230215W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S45348.04

Sample Tag: DUP-06_021423

Collected Date/Time: 02/14/2023 00:01

Matrix: Groundwater

COC Reference: 152332

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 22:07	230215A7	VF230215W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S45348.05

Sample Tag: Trip Blank

Collected Date/Time: 02/13/2023 00:01

Matrix: Water

COC Reference: 152332

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 22:54	230215A7	VF230215W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230215W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45348.02	Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 21:20	230215A7
S45348.03	Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 21:43	230215A7
S45348.04	Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 22:07	230215A7
S45348.05	Volatile Organics - DEQ List	SW5030C/8260C	02/15/23 22:54	230215A7

Organics - Volatiles, Prep Batch ID: VF230216W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45348.01	Volatile Organics - DEQ List	SW5030C/8260C	02/16/23 14:30	230216A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45348.01

Sample Tag: MW-22-154_021323

Collected Date/Time: 02/13/2023 12:55

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230216A9, Run Date: 02/16/2023 14:30, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.4**	80.0	124.0
1,2-Dichloroethane-D4		**105.0**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45348.02

Sample Tag: MW-20-132_021423

Collected Date/Time: 02/14/2023 15:20

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 21:20, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.1**	80.0	124.0
1,2-Dichloroethane-D4		**106.0**	72.0	125.0
Toluene-D8		**108.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45348.03

Sample Tag: MW-20-131_021423

Collected Date/Time: 02/14/2023 16:20

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 21:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.9**	80.0	124.0
1,2-Dichloroethane-D4		**104.7**	72.0	125.0
Toluene-D8		**108.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45348.04

Sample Tag: DUP-06_021423

Collected Date/Time: 02/14/2023 00:01

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 22:07, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.2**	80.0	124.0
1,2-Dichloroethane-D4		**104.2**	72.0	125.0
Toluene-D8		**107.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45348.05

Sample Tag: Trip Blank

Collected Date/Time: 02/13/2023 00:01

Matrix: Water

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 22:54, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.3**	80.0	124.0
1,2-Dichloroethane-D4		**105.0**	72.0	125.0
Toluene-D8		**107.7**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230215W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230215A7.BLKW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 14:20, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**107.8**	80.0	124.0
1,2-Dichloroethane-D4		**106.8**	72.0	125.0
Toluene-D8		**108.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 12:45, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**112.2**	80.0	124.0
1,2-Dichloroethane-D4		**106.3**	72.0	125.0
Toluene-D8		**109.1**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230215A7.LCSDW15A, Parent Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 13:09, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.4**	80.0	124.0
1,2-Dichloroethane-D4		**113.9**	72.0	125.0
Toluene-D8		**110.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230216W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230216A9.BLKW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 13:32, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**98.7**	80.0	124.0
1,2-Dichloroethane-D4		**100.1**	72.0	125.0
Toluene-D8		**100.2**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:15, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.5**	80.0	124.0
1,2-Dichloroethane-D4		**91.2**	72.0	125.0
Toluene-D8		**100.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230216A9.LCSDW16A, Parent Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:34, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.0**	80.0	124.0
1,2-Dichloroethane-D4		**98.6**	72.0	125.0
Toluene-D8		**100.7**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45348.01

Sample Tag: MW-22-154_021323

Collected Date/Time: 02/13/2023 12:55

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230216A9, Run Date: 02/16/2023 14:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**92.5**	50.0	200.0
1,4-Difluorobenzene		**96.4**	50.0	200.0
Chlorobenzene-D5		**98.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45348.02

Sample Tag: MW-20-132_021423

Collected Date/Time: 02/14/2023 15:20

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 21:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**97.5**	50.0	200.0
1,4-Difluorobenzene		**99.8**	50.0	200.0
Chlorobenzene-D5		**98.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45348.03

Sample Tag: MW-20-131_021423

Collected Date/Time: 02/14/2023 16:20

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 21:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.2**	50.0	200.0
1,4-Difluorobenzene		**95.9**	50.0	200.0
Chlorobenzene-D5		**93.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**93.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45348.04

Sample Tag: DUP-06_021423

Collected Date/Time: 02/14/2023 00:01

Matrix: Groundwater

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 22:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**96.3**	50.0	200.0
1,4-Difluorobenzene		**97.1**	50.0	200.0
Chlorobenzene-D5		**95.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**94.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45348.05

Sample Tag: Trip Blank

Collected Date/Time: 02/13/2023 00:01

Matrix: Water

COC Reference: 152332

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230215A7, Run Date: 02/15/2023 22:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**98.4**	50.0	200.0
1,4-Difluorobenzene		**99.2**	50.0	200.0
Chlorobenzene-D5		**97.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230215W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230215A7.BLKW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 14:20, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**95.3**	50.0	200.0
1,4-Difluorobenzene		**95.4**	50.0	200.0
Chlorobenzene-D5		**94.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**93.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 12:45, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.1**	50.0	200.0
1,4-Difluorobenzene		**96.1**	50.0	200.0
Chlorobenzene-D5		**95.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230215A7.LCSDW15A, Parent Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 13:09, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.4**	50.0	200.0
1,4-Difluorobenzene		**99.4**	50.0	200.0
Chlorobenzene-D5		**101.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230216W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230216A9.BLKW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 13:32, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.0**	50.0	200.0
1,4-Difluorobenzene		**100.7**	50.0	200.0
Chlorobenzene-D5		**101.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:15, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.3**	50.0	200.0
1,4-Difluorobenzene		**100.3**	50.0	200.0
Chlorobenzene-D5		**99.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230216A9.LCSDW16A, Parent Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:34, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**103.1**	50.0	200.0
1,4-Difluorobenzene		**102.9**	50.0	200.0
Chlorobenzene-D5		**104.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**107.9**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230215W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230215A7.BLKW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 14:20, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230215W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230215A7.BLKW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 14:20, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 12:45, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		96.2	67.4	121.2
Acetone		101.5	29.9	161.5
Methyl iodide		100.4	68.8	116.4
Carbon disulfide		101.2	63.8	137.4
tert-Methyl butyl ether (MTBE)		98.5	73.2	122.4
Acrylonitrile		98.0	69.9	128.9
2-Butanone (MEK)		99.1	44.0	134.4
Dichlorodifluoromethane		91.6	10.0	222.8
Chloromethane		124.7	23.8	166.5
Vinyl chloride		111.9	43.5	149.1
Bromomethane		120.4	56.8	151.3
Chloroethane		121.7	53.4	149.4
Trichlorofluoromethane		108.8	59.7	151.8
1,1-Dichloroethene		101.2	69.6	139.4
Methylene chloride		100.6	73.3	121.1
trans-1,2-Dichloroethene		99.9	73.6	129.3
1,1-Dichloroethane		99.5	71.5	126.2
cis-1,2-Dichloroethene		98.7	76.6	122.1
Tetrahydrofuran		87.6	59.0	117.9
Chloroform		100.3	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230215W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 12:45, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		97.0	78.2	120.8
1,1,1-Trichloroethane		99.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		94.9	71.6	125.2
2-Hexanone		99.5	55.4	136.9
Carbon tetrachloride		97.2	72.6	133.0
Benzene		101.4	79.9	124.9
1,2-Dichloroethane		98.7	76.0	126.3
Trichloroethene		102.2	79.7	124.2
1,2-Dichloropropane		100.6	78.6	126.4
Bromodichloromethane		102.3	80.4	128.2
Dibromomethane		102.1	76.9	122.1
cis-1,3-Dichloropropene		102.5	79.8	129.9
Toluene		103.3	79.8	124.5
trans-1,3-Dichloropropene		100.1	74.0	131.3
1,1,2-Trichloroethane		100.7	78.7	123.1
Tetrachloroethene		104.8	74.5	124.5
trans-1,4-Dichloro-2-butene	*	32.1	68.6	135.4
Dibromochloromethane		101.3	74.6	127.2
1,2-Dibromoethane		100.7	70.3	133.7
Chlorobenzene		101.9	79.2	122.7
1,1,1,2-Tetrachloroethane		101.5	80.3	128.2
Ethylbenzene		106.0	79.5	129.1
p,m-Xylene		104.1	79.4	132.2
o-Xylene		104.4	80.2	131.0
Styrene		106.2	69.5	126.7
Isopropylbenzene		104.9	74.4	121.5
Bromoform		100.4	69.4	128.0
1,1,2,2-Tetrachloroethane		100.0	79.8	126.3
1,2,3-Trichloropropane		99.5	78.3	138.8
n-Propylbenzene		106.3	82.0	130.7
Bromobenzene		105.9	78.7	124.6
1,3,5-Trimethylbenzene		104.5	81.3	128.9
tert-Butylbenzene		104.0	80.7	128.9
1,2,4-Trimethylbenzene		105.9	81.4	130.8
sec-Butylbenzene		108.1	77.4	129.8
p-Isopropyltoluene		108.5	79.8	137.5
1,3-Dichlorobenzene		105.2	77.0	131.3
1,4-Dichlorobenzene		105.1	20.7	137.7
1,2-Dichlorobenzene		104.4	10.0	166.2
1,2,3-Trimethylbenzene		105.3	76.3	124.2
n-Butylbenzene		112.7	80.0	133.3
Hexachloroethane		102.7	23.8	138.1
1,2-Dibromo-3-chloropropane		99.0	21.2	189.4
1,2,4-Trichlorobenzene		111.2	27.4	143.4
1,2,3-Trichlorobenzene		110.4	75.4	131.4
Naphthalene		101.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230215W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 12:45, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		105.7	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230215A7.LCSDW15A, Parent Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 13:09, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether	*	121.9	67.4	121.2	23.6	30.0
Acetone		108.7	29.9	161.5	6.9	30.0
Methyl iodide		98.6	68.8	116.4	1.9	30.0
Carbon disulfide		97.7	63.8	137.4	3.5	30.0
tert-Methyl butyl ether (MTBE)		100.9	73.2	122.4	2.4	30.0
Acrylonitrile		103.4	69.9	128.9	5.3	30.0
2-Butanone (MEK)		102.5	44.0	134.4	3.4	30.0
Dichlorodifluoromethane		87.9	10.0	222.8	4.1	30.0
Chloromethane		124.0	23.8	166.5	0.5	30.0
Vinyl chloride		109.7	43.5	149.1	2.0	30.0
Bromomethane		117.8	56.8	151.3	2.2	30.0
Chloroethane		116.2	53.4	149.4	4.6	30.0
Trichlorofluoromethane		104.9	59.7	151.8	3.7	30.0
1,1-Dichloroethene		100.6	69.6	139.4	0.6	30.0
Methylene chloride		98.7	73.3	121.1	1.9	30.0
trans-1,2-Dichloroethene		96.3	73.6	129.3	3.7	30.0
1,1-Dichloroethane		96.9	71.5	126.2	2.6	30.0
cis-1,2-Dichloroethene		97.6	76.6	122.1	1.1	30.0
Tetrahydrofuran		96.9	59.0	117.9	10.0	30.0
Chloroform		98.4	78.4	124.0	1.9	30.0
Bromochloromethane		99.2	78.2	120.8	2.3	30.0
1,1,1-Trichloroethane		94.5	79.4	130.9	4.7	30.0
4-Methyl-2-pentanone (MIBK)		98.0	71.6	125.2	3.2	30.0
2-Hexanone		103.2	55.4	136.9	3.7	30.0
Carbon tetrachloride		90.7	72.6	133.0	7.0	30.0
Benzene		96.5	79.9	124.9	5.0	30.0
1,2-Dichloroethane		97.6	76.0	126.3	1.1	30.0
Trichloroethene		95.2	79.7	124.2	7.2	30.0
1,2-Dichloropropane		98.9	78.6	126.4	1.6	30.0
Bromodichloromethane		100.8	80.4	128.2	1.4	30.0
Dibromomethane		101.4	76.9	122.1	0.7	30.0
cis-1,3-Dichloropropene		98.5	79.8	129.9	3.9	30.0
Toluene		98.4	79.8	124.5	4.8	30.0
trans-1,3-Dichloropropene		98.4	74.0	131.3	1.7	30.0
1,1,2-Trichloroethane		101.3	78.7	123.1	0.6	30.0
Tetrachloroethene		98.8	74.5	124.5	5.9	30.0
trans-1,4-Dichloro-2-butene	*	29.1	68.6	135.4	9.9	30.0
Dibromochloromethane		97.2	74.6	127.2	4.1	30.0
1,2-Dibromoethane		98.4	70.3	133.7	2.4	30.0
Chlorobenzene		96.4	79.2	122.7	5.5	30.0

Organics - Volatiles, Prep Batch ID: VF230215W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230215A7.LCSDW15A, Parent Sample ID: 230215A7.LCSW15A

Run in Batch: 230215A7, Run Date: 02/15/2023 13:09, Prep Date: 02/15/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.6	80.3	128.2	4.9	30.0
Ethylbenzene		97.8	79.5	129.1	8.0	30.0
p,m-Xylene		96.3	79.4	132.2	7.8	30.0
o-Xylene		98.3	80.2	131.0	6.0	30.0
Styrene		100.3	69.5	126.7	5.7	30.0
Isopropylbenzene		97.3	74.4	121.5	7.5	30.0
Bromoform		100.2	69.4	128.0	0.1	30.0
1,1,2,2-Tetrachloroethane		99.3	79.8	126.3	0.7	30.0
1,2,3-Trichloropropane		98.0	78.3	138.8	1.6	30.0
n-Propylbenzene		98.1	82.0	130.7	8.0	30.0
Bromobenzene		101.7	78.7	124.6	4.1	30.0
1,3,5-Trimethylbenzene		97.8	81.3	128.9	6.6	30.0
tert-Butylbenzene		96.3	80.7	128.9	7.7	30.0
1,2,4-Trimethylbenzene		99.4	81.4	130.8	6.4	30.0
sec-Butylbenzene		98.5	77.4	129.8	9.3	30.0
p-Isopropyltoluene		100.2	79.8	137.5	8.0	30.0
1,3-Dichlorobenzene		99.5	77.0	131.3	5.6	30.0
1,4-Dichlorobenzene		100.6	20.7	137.7	4.3	30.0
1,2-Dichlorobenzene		100.7	10.0	166.2	3.5	30.0
1,2,3-Trimethylbenzene		99.8	76.3	124.2	5.4	30.0
n-Butylbenzene		103.1	80.0	133.3	9.0	30.0
Hexachloroethane		95.0	23.8	138.1	7.8	30.0
1,2-Dibromo-3-chloropropane		98.7	21.2	189.4	0.3	30.0
1,2,4-Trichlorobenzene		104.0	27.4	143.4	6.7	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	3.4	30.0
Naphthalene		102.0	32.9	135.8	0.6	30.0
2-Methylnaphthalene		106.3	25.5	165.5	0.5	30.0

Organics - Volatiles, Prep Batch ID: VF230216W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230216A9.BLKW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 13:32, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230216W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230216A9.BLKW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 13:32, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:15, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		95.6	67.4	121.2
Acetone		84.7	29.9	161.5
Methyl iodide		83.9	68.8	116.4
Carbon disulfide		79.1	63.8	137.4
tert-Methyl butyl ether (MTBE)		78.5	73.2	122.4
Acrylonitrile		86.9	69.9	128.9
2-Butanone (MEK)		93.5	44.0	134.4
Dichlorodifluoromethane		93.6	10.0	222.8
Chloromethane		96.3	23.8	166.5
Vinyl chloride		87.6	43.5	149.1
Bromomethane		100.4	56.8	151.3
Chloroethane		91.9	53.4	149.4
Trichlorofluoromethane		85.7	59.7	151.8
1,1-Dichloroethene		82.9	69.6	139.4
Methylene chloride		89.8	73.3	121.1
trans-1,2-Dichloroethene		91.5	73.6	129.3
1,1-Dichloroethane		91.5	71.5	126.2
cis-1,2-Dichloroethene		93.7	76.6	122.1
Tetrahydrofuran		82.5	59.0	117.9
Chloroform		96.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230216W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:15, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		96.0	78.2	120.8
1,1,1-Trichloroethane		89.2	79.4	130.9
4-Methyl-2-pentanone (MIBK)		89.3	71.6	125.2
2-Hexanone		88.7	55.4	136.9
Carbon tetrachloride		96.9	72.6	133.0
Benzene		99.7	79.9	124.9
1,2-Dichloroethane		107.1	76.0	126.3
Trichloroethene		99.3	79.7	124.2
1,2-Dichloropropane		102.5	78.6	126.4
Bromodichloromethane		107.9	80.4	128.2
Dibromomethane		103.0	76.9	122.1
cis-1,3-Dichloropropene		106.9	79.8	129.9
Toluene		101.7	79.8	124.5
trans-1,3-Dichloropropene		107.5	74.0	131.3
1,1,2-Trichloroethane		104.6	78.7	123.1
Tetrachloroethene		100.2	74.5	124.5
trans-1,4-Dichloro-2-butene		85.2	68.6	135.4
Dibromochloromethane		103.7	74.6	127.2
1,2-Dibromoethane		97.8	70.3	133.7
Chlorobenzene		98.3	79.2	122.7
1,1,1,2-Tetrachloroethane		98.2	80.3	128.2
Ethylbenzene		98.2	79.5	129.1
p,m-Xylene		99.1	79.4	132.2
o-Xylene		99.8	80.2	131.0
Styrene		101.3	69.5	126.7
Isopropylbenzene		96.4	74.4	121.5
Bromoform		101.3	69.4	128.0
1,1,2,2-Tetrachloroethane		90.6	79.8	126.3
1,2,3-Trichloropropane		94.4	78.3	138.8
n-Propylbenzene		96.5	82.0	130.7
Bromobenzene		101.4	78.7	124.6
1,3,5-Trimethylbenzene		94.2	81.3	128.9
tert-Butylbenzene		98.6	80.7	128.9
1,2,4-Trimethylbenzene		95.8	81.4	130.8
sec-Butylbenzene		94.6	77.4	129.8
p-Isopropyltoluene		95.4	79.8	137.5
1,3-Dichlorobenzene		99.5	77.0	131.3
1,4-Dichlorobenzene		99.4	20.7	137.7
1,2-Dichlorobenzene		99.4	10.0	166.2
1,2,3-Trimethylbenzene		98.1	76.3	124.2
n-Butylbenzene		96.6	80.0	133.3
Hexachloroethane		94.8	23.8	138.1
1,2-Dibromo-3-chloropropane		86.7	21.2	189.4
1,2,4-Trichlorobenzene		93.8	27.4	143.4
1,2,3-Trichlorobenzene		93.6	75.4	131.4
Naphthalene		89.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230216W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:15, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		96.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230216A9.LCSDW16A, Parent Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:34, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		95.2	67.4	121.2	0.4	30.0
Acetone		91.5	29.9	161.5	7.7	30.0
Methyl iodide		76.4	68.8	116.4	9.4	30.0
Carbon disulfide		69.7	63.8	137.4	12.6	30.0
tert-Methyl butyl ether (MTBE)		82.0	73.2	122.4	4.4	30.0
Acrylonitrile		94.1	69.9	128.9	8.0	30.0
2-Butanone (MEK)		96.0	44.0	134.4	2.6	30.0
Dichlorodifluoromethane		88.6	10.0	222.8	5.5	30.0
Chloromethane		92.6	23.8	166.5	3.9	30.0
Vinyl chloride		92.9	43.5	149.1	5.9	30.0
Bromomethane		94.3	56.8	151.3	6.3	30.0
Chloroethane		87.7	53.4	149.4	4.6	30.0
Trichlorofluoromethane		75.3	59.7	151.8	13.0	30.0
1,1-Dichloroethene		73.5	69.6	139.4	11.9	30.0
Methylene chloride		81.9	73.3	121.1	9.2	30.0
trans-1,2-Dichloroethene		86.9	73.6	129.3	5.1	30.0
1,1-Dichloroethane		86.9	71.5	126.2	5.2	30.0
cis-1,2-Dichloroethene		90.5	76.6	122.1	3.5	30.0
Tetrahydrofuran		95.3	59.0	117.9	14.4	30.0
Chloroform		93.1	78.4	124.0	3.4	30.0
Bromochloromethane		94.8	78.2	120.8	1.3	30.0
1,1,1-Trichloroethane		84.5	79.4	130.9	5.5	30.0
4-Methyl-2-pentanone (MIBK)		95.2	71.6	125.2	6.4	30.0
2-Hexanone		99.3	55.4	136.9	11.3	30.0
Carbon tetrachloride		89.4	72.6	133.0	8.1	30.0
Benzene		95.8	79.9	124.9	3.9	30.0
1,2-Dichloroethane		106.4	76.0	126.3	0.7	30.0
Trichloroethene		95.1	79.7	124.2	4.3	30.0
1,2-Dichloropropane		100.7	78.6	126.4	1.7	30.0
Bromodichloromethane		104.6	80.4	128.2	3.2	30.0
Dibromomethane		105.8	76.9	122.1	2.7	30.0
cis-1,3-Dichloropropene		106.2	79.8	129.9	0.7	30.0
Toluene		98.3	79.8	124.5	3.4	30.0
trans-1,3-Dichloropropene		108.4	74.0	131.3	0.9	30.0
1,1,2-Trichloroethane		108.0	78.7	123.1	3.2	30.0
Tetrachloroethene		96.3	74.5	124.5	4.0	30.0
trans-1,4-Dichloro-2-butene		89.2	68.6	135.4	4.6	30.0
Dibromochloromethane		99.9	74.6	127.2	3.8	30.0
1,2-Dibromoethane		97.6	70.3	133.7	0.2	30.0
Chlorobenzene		93.6	79.2	122.7	4.9	30.0

Organics - Volatiles, Prep Batch ID: VF230216W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230216A9.LCSDW16A, Parent Sample ID: 230216A9.LCSW16A

Run in Batch: 230216A9, Run Date: 02/16/2023 12:34, Prep Date: 02/16/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		92.8	80.3	128.2	5.6	30.0
Ethylbenzene		92.2	79.5	129.1	6.3	30.0
p,m-Xylene		92.5	79.4	132.2	6.8	30.0
o-Xylene		94.7	80.2	131.0	5.2	30.0
Styrene		95.5	69.5	126.7	5.8	30.0
Isopropylbenzene		90.0	74.4	121.5	6.8	30.0
Bromoform		100.8	69.4	128.0	0.5	30.0
1,1,2,2-Tetrachloroethane		93.3	79.8	126.3	3.0	30.0
1,2,3-Trichloropropane		99.5	78.3	138.8	5.3	30.0
n-Propylbenzene		90.8	82.0	130.7	6.1	30.0
Bromobenzene		96.3	78.7	124.6	5.2	30.0
1,3,5-Trimethylbenzene		88.9	81.3	128.9	5.7	30.0
tert-Butylbenzene		92.2	80.7	128.9	6.8	30.0
1,2,4-Trimethylbenzene		90.2	81.4	130.8	6.0	30.0
sec-Butylbenzene		84.5	77.4	129.8	11.3	30.0
p-Isopropyltoluene		84.9	79.8	137.5	11.6	30.0
1,3-Dichlorobenzene		90.5	77.0	131.3	9.5	30.0
1,4-Dichlorobenzene		90.4	20.7	137.7	9.4	30.0
1,2-Dichlorobenzene		90.4	10.0	166.2	9.5	30.0
1,2,3-Trimethylbenzene		89.2	76.3	124.2	9.5	30.0
n-Butylbenzene		83.9	80.0	133.3	14.0	30.0
Hexachloroethane		84.8	23.8	138.1	11.1	30.0
1,2-Dibromo-3-chloropropane		85.6	21.2	189.4	1.3	30.0
1,2,4-Trichlorobenzene		85.0	27.4	143.4	9.9	30.0
1,2,3-Trichlorobenzene		87.9	75.4	131.4	6.2	30.0
Naphthalene		86.1	32.9	135.8	3.7	30.0
2-Methylnaphthalene		96.6	25.5	165.5	0.4	30.0

Merit Laboratories Login Checklist

Lab Set ID: S45348
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: Racer Lansing 30171056.0470A
Submitted: 02/15/2023 09:20 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 8.1
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152332

CHAIN OF CUSTODY RECORD PLANT-6

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2246 CELL NO.: 947-777-5215 P.O. NO.: 30112892
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Cobon

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260 6 SIMS
45348.01	2/13/23	12:55	MW-22-154_021323	GW	3		3						X
.02	2/14/23	15:20	MW-20-132_021423	GW	3		3						X
.03	2/14/23	16:20	MW-20-131_021423	GW	3		3						X
.04	2/14/23	—	DUP-06_021423	GW	3		3						X
.05	2/13/23	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS ~~Sampler~~	DATE 2-15-23	TIME 0920
RECEIVED BY: SIGNATURE/ORGANIZATION	Johanna Murray	DATE 2/15/23	TIME 0920
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 8.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S45491.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S45491.01-S45491.14
Project: 30112892 / RACER Lansing
Collected Date(s): 02/15/2023 - 02/16/2023
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30112892

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (14 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S45491.01	MW-22-156_021523	Groundwater	02/15/23 10:15
S45491.02	MW-22-153_021523	Groundwater	02/15/23 11:10
S45491.03	MW-22-155_021523	Groundwater	02/15/23 12:20
S45491.04	MW-14-58R_021523	Groundwater	02/15/23 13:25
S45491.05	DUP-01_021523	Groundwater	02/15/23 00:01
S45491.06	MW-22-157_021523	Groundwater	02/15/23 14:30
S45491.07	MW-21-139_021523	Groundwater	02/15/23 15:55
S45491.08	MW-21-140_021623	Groundwater	02/16/23 09:20
S45491.09	MW-21-140_021623 MS	Groundwater	02/16/23 09:20
S45491.10	MW-21-140_021623 MSD	Groundwater	02/16/23 09:20
S45491.11	MW-16-78_021623	Groundwater	02/16/23 11:20
S45491.12	DUP-02_021623	Groundwater	02/16/23 00:01
S45491.13	Trip Blank	Water	02/15/23 00:01
S45491.14	MW-19-123_021623	Groundwater	02/16/23 12:55

Analytical Laboratory Report

Lab Sample ID: S45491.01
Sample Tag: MW-22-156_021523
Collected Date/Time: 02/15/2023 10:15
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/24/23 17:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	47	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 17:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	16	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	25	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	463	1		ug/L	1	75-34-3	E
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	1	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	

E-Concentration exceeds calibration range

Lab Sample ID: S45491.01 (continued)
Sample Tag: MW-22-156_021523

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 17:59, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 02/24/23 13:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S45491.01 (continued)
Sample Tag: MW-22-156_021523

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 02/24/23 13:26, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	20	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	390	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S45491.01 (continued)
Sample Tag: MW-22-156_021523

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 02/24/23 13:26, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S45491.02
Sample Tag: MW-22-153_021523
Collected Date/Time: 02/15/2023 11:10
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/24/23 17:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	26	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 18:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	54	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S45491.02 (continued)
Sample Tag: MW-22-153_021523

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 18:22, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.03
Sample Tag: MW-22-155_021523
Collected Date/Time: 02/15/2023 12:20
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/24/23 18:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	36	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 18:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S45491.03 (continued)
Sample Tag: MW-22-155_021523

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 18:46, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.04
Sample Tag: MW-14-58R_021523
Collected Date/Time: 02/15/2023 13:25
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/24/23 18:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	178	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S45491.04 (continued)
Sample Tag: MW-14-58R_021523

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:09, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.05
Sample Tag: DUP-01_021523
Collected Date/Time: 02/15/2023 00:01
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/24/23 18:47, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	181	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S45491.05 (continued)
Sample Tag: DUP-01_021523

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:32, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S45491.06
Sample Tag: MW-22-157_021523
Collected Date/Time: 02/15/2023 14:30
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 14:16, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45491.07
Sample Tag: MW-21-139_021523
Collected Date/Time: 02/15/2023 15:55
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/27/23 10:25	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 18:08, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S45491.08
Sample Tag: MW-21-140_021623
Collected Date/Time: 02/16/2023 09:20
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR
2	1L Amber	None	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/27/23 10:25	NDK	
BNA Extraction	Completed	SW3510C	02/22/23 13:30	JWR	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/23/23 23:41, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S45491.08 (continued)
Sample Tag: MW-21-140_021623

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/23/23 23:41, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene*	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 15:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S45491.08 (continued)
Sample Tag: MW-21-140_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:56, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S45491.08 (continued)
Sample Tag: MW-21-140_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 19:56, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.09
Sample Tag: MW-21-140_021623 MS
Collected Date/Time: 02/16/2023 09:20
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR
2	1L Amber	None	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	
BNA Extraction	Completed	SW3510C	02/22/23 13:30	JWR	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 00:11, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	33	5		ug/L	2	83-32-9	1
Acenaphthylene	34	5		ug/L	2	208-96-8	1
Anthracene	35	5		ug/L	2	120-12-7	1
Benzo(a)anthracene	34	1		ug/L	2	56-55-3	1
Benzo(b)fluoranthene	36	1		ug/L	2	205-99-2	1
Benzo(k)fluoranthene	34	1		ug/L	2	207-08-9	1
Benzo(ghi)perylene	33	1		ug/L	2	191-24-2	1
Benzo(a)pyrene	34	1		ug/L	2	50-32-8	1
bis(2-Chloroethoxy)methane	32	5		ug/L	2	111-91-1	1
bis(2-Chloroethyl)ether	29	5		ug/L	2	111-44-4	1
bis(2-Chloroisopropyl)ether*	27	5		ug/L	2	108-60-1	1
bis(2-Ethylhexyl)phthalate	33	5		ug/L	2	117-81-7	1
4-Bromophenyl phenyl ether	35	5		ug/L	2	101-55-3	1
Butyl benzyl phthalate	33	5		ug/L	2	85-68-7	1
4-Chloroaniline	21	10		ug/L	2	106-47-8	1
2-Chloronaphthalene	33	5		ug/L	2	91-58-7	1
4-Chloro-3-methylphenol	32	5		ug/L	2	59-50-7	1
2-Chlorophenol	27	10		ug/L	2	95-57-8	1
4-Chlorophenyl phenyl ether	34	5		ug/L	2	7005-72-3	1
Chrysene	33	1		ug/L	2	218-01-9	1
3-, 4-Methylphenol (p,m-Cresol)	24	20		ug/L	2	3/4-CRESOL	1
2-Methylphenol (o-Cresol)	25	10		ug/L	2	95-48-7	1
Dibenzo(ah)anthracene	34	2		ug/L	2	53-70-3	1
Dibenzofuran	34	4		ug/L	2	132-64-9	1
di-n-Butyl phthalate	35	5		ug/L	2	84-74-2	1
1,2-Dichlorobenzene	29	1		ug/L	2	95-50-1	1
1,3-Dichlorobenzene	28	1		ug/L	2	541-73-1	1
1,4-Dichlorobenzene	28	1		ug/L	2	106-46-7	1
3,3'-Dichlorobenzidine	28	5		ug/L	2	91-94-1	1
2,4-Dichlorophenol	32	10		ug/L	2	120-83-2	1
Diethyl phthalate	34	5		ug/L	2	84-66-2	1
2,4-Dimethylphenol	31	5		ug/L	2	105-67-9	1
Dimethyl phthalate	34	5		ug/L	2	131-11-3	1
4,6-Dinitro-2-methylphenol	30	20		ug/L	2	534-52-1	1

1-Sample spiked at 0.050 mg/l

Lab Sample ID: S45491.09 (continued)
Sample Tag: MW-21-140_021623 MS

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 00:11, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	1
2,4-Dinitrotoluene	34	5		ug/L	2	121-14-2	1
2,6-Dinitrotoluene	34	5		ug/L	2	606-20-2	1
1,2-Diphenylhydrazine*	33	5		ug/L	2	122-66-7	1
di-n-Octyl phthalate	36	5		ug/L	2	117-84-0	1
Fluoranthene	34	1		ug/L	2	206-44-0	1
Fluorene	34	5		ug/L	2	86-73-7	1
Hexachlorobenzene	34	5		ug/L	2	118-74-1	1
Hexachlorobutadiene	33	10		ug/L	2	87-68-3	1
Hexachlorocyclopentadiene*	37	5		ug/L	2	77-47-4	1
Hexachloroethane	28	5		ug/L	2	67-72-1	1
Indeno(1,2,3-cd)pyrene	34	2		ug/L	2	193-39-5	1
Isophorone	32	5		ug/L	2	78-59-1	1
2-Methylnaphthalene	33	5		ug/L	2	91-57-6	1
Naphthalene	32	5		ug/L	2	91-20-3	1
2-Nitroaniline	33	25		ug/L	2	88-74-4	1
3-Nitroaniline	26	25		ug/L	2	99-09-2	1
4-Nitroaniline	30	25		ug/L	2	100-01-6	1
Nitrobenzene	30	5		ug/L	2	98-95-3	1
2-Nitrophenol	32	5		ug/L	2	88-75-5	1
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	1
N-Nitrosodiphenylamine	35	5		ug/L	2	86-30-6	1
N-Nitrosodi-n-propylamine	31	5		ug/L	2	621-64-7	1
Pentachlorophenol	26	5		ug/L	2	87-86-5	1
Phenanthrene	33	2		ug/L	2	85-01-8	1
Phenol	13	5		ug/L	2	108-95-2	1
Pyrene	34	5		ug/L	2	129-00-0	1
1,2,4-Trichlorobenzene	32	5		ug/L	2	120-82-1	1
2,4,5-Trichlorophenol	34	5		ug/L	2	95-95-4	1
2,4,6-Trichlorophenol	32	4		ug/L	2	88-06-2	1

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 12:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	43	1		ug/L	1	123-91-1	2

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	64	10		ug/L	1	60-29-7	2
Acetone	64	50		ug/L	1	67-64-1	2
Methyl iodide	49	1		ug/L	1	74-88-4	2
Carbon disulfide	44	5		ug/L	1	75-15-0	2
tert-Methyl butyl ether (MTBE)	55	5		ug/L	1	1634-04-4	2
Acrylonitrile	62	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	68	25		ug/L	1	78-93-3	2
Dichlorodifluoromethane	43	5		ug/L	1	75-71-8	2
Chloromethane	54	5		ug/L	1	74-87-3	2
Vinyl chloride	49	1		ug/L	1	75-01-4	2

1-Sample spiked at 0.050 mg/l
2-Spiked at 50ug/L

Lab Sample ID: S45491.09 (continued)
Sample Tag: MW-21-140_021623 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bromomethane	54	5		ug/L	1	74-83-9	1
Chloroethane	54	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	47	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	53	1		ug/L	1	75-35-4	1
Methylene chloride	52	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	48	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	50	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	50	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	50	1		ug/L	1	67-66-3	1
Bromochloromethane	51	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	46	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	55	50		ug/L	1	108-10-1	1
2-Hexanone	56	50		ug/L	1	591-78-6	1
Carbon tetrachloride	42	1		ug/L	1	56-23-5	1
Benzene	46	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	48	1		ug/L	1	107-06-2	1
Trichloroethene	46	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	48	1		ug/L	1	78-87-5	1
Bromodichloromethane	47	1		ug/L	1	75-27-4	1
Dibromomethane	50	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	47	1		ug/L	1	10061-01-5	1
Toluene	47	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	47	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	49	1		ug/L	1	79-00-5	1
Tetrachloroethene	46	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	41	1		ug/L	1	110-57-6	1
Dibromochloromethane	45	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	48	1		ug/L	1	106-93-4	1
Chlorobenzene	46	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	45	1		ug/L	1	630-20-6	1
Ethylbenzene	47	1		ug/L	1	100-41-4	1
p,m-Xylene*	91	2		ug/L	1		1
o-Xylene	46	1		ug/L	1	95-47-6	1
Styrene	46	1		ug/L	1	100-42-5	1
Isopropylbenzene	46	5		ug/L	1	98-82-8	1
Bromoform	46	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	51	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	49	1		ug/L	1	96-18-4	1
n-Propylbenzene	47	1		ug/L	1	103-65-1	1
Bromobenzene	47	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	46	1		ug/L	1	108-67-8	1
tert-Butylbenzene	45	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	47	1		ug/L	1	95-63-6	1
sec-Butylbenzene	47	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	48	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	47	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	48	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	47	1		ug/L	1	95-50-1	1

1-Spiked at 50ug/L

Lab Sample ID: S45491.09 (continued)
Sample Tag: MW-21-140_021623 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,3-Trimethylbenzene	47	1		ug/L	1	526-73-8	1
n-Butylbenzene	48	1		ug/L	1	104-51-8	1
Hexachloroethane	43	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	52	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	50	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	49	5		ug/L	1	87-61-6	1
Naphthalene	50	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	49	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S45491.10
Sample Tag: MW-21-140_021623 MSD
Collected Date/Time: 02/16/2023 09:20
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR
2	1L Amber	None	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	
BNA Extraction	Completed	SW3510C	02/22/23 13:30	JWR	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 00:41, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	35	5		ug/L	2	83-32-9	1
Acenaphthylene	36	5		ug/L	2	208-96-8	1
Anthracene	38	5		ug/L	2	120-12-7	1
Benzo(a)anthracene	38	1		ug/L	2	56-55-3	1
Benzo(b)fluoranthene	39	1		ug/L	2	205-99-2	1
Benzo(k)fluoranthene	37	1		ug/L	2	207-08-9	1
Benzo(ghi)perylene	35	1		ug/L	2	191-24-2	1
Benzo(a)pyrene	37	1		ug/L	2	50-32-8	1
bis(2-Chloroethoxy)methane	33	5		ug/L	2	111-91-1	1
bis(2-Chloroethyl)ether	31	5		ug/L	2	111-44-4	1
bis(2-Chloroisopropyl)ether*	28	5		ug/L	2	108-60-1	1
bis(2-Ethylhexyl)phthalate	37	5		ug/L	2	117-81-7	1
4-Bromophenyl phenyl ether	37	5		ug/L	2	101-55-3	1
Butyl benzyl phthalate	37	5		ug/L	2	85-68-7	1
4-Chloroaniline	20	10		ug/L	2	106-47-8	1
2-Chloronaphthalene	34	5		ug/L	2	91-58-7	1
4-Chloro-3-methylphenol	33	5		ug/L	2	59-50-7	1
2-Chlorophenol	29	10		ug/L	2	95-57-8	1
4-Chlorophenyl phenyl ether	37	5		ug/L	2	7005-72-3	1
Chrysene	37	1		ug/L	2	218-01-9	1
3-, 4-Methylphenol (p,m-Cresol)	25	20		ug/L	2	3/4-CRESOL	1
2-Methylphenol (o-Cresol)	27	10		ug/L	2	95-48-7	1
Dibenzo(ah)anthracene	35	2		ug/L	2	53-70-3	1
Dibenzofuran	36	4		ug/L	2	132-64-9	1
di-n-Butyl phthalate	40	5		ug/L	2	84-74-2	1
1,2-Dichlorobenzene	31	1		ug/L	2	95-50-1	1
1,3-Dichlorobenzene	31	1		ug/L	2	541-73-1	1
1,4-Dichlorobenzene	30	1		ug/L	2	106-46-7	1
3,3'-Dichlorobenzidine	30	5		ug/L	2	91-94-1	1
2,4-Dichlorophenol	34	10		ug/L	2	120-83-2	1
Diethyl phthalate	38	5		ug/L	2	84-66-2	1
2,4-Dimethylphenol	32	5		ug/L	2	105-67-9	1
Dimethyl phthalate	37	5		ug/L	2	131-11-3	1
4,6-Dinitro-2-methylphenol	34	20		ug/L	2	534-52-1	1

1-Sample spiked at 0.050 mg/l

Lab Sample ID: S45491.10 (continued)
Sample Tag: MW-21-140_021623 MSD

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 00:41, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrophenol	26	25		ug/L	2	51-28-5	1
2,4-Dinitrotoluene	38	5		ug/L	2	121-14-2	1
2,6-Dinitrotoluene	37	5		ug/L	2	606-20-2	1
1,2-Diphenylhydrazine*	36	5		ug/L	2	122-66-7	1
di-n-Octyl phthalate	38	5		ug/L	2	117-84-0	1
Fluoranthene	38	1		ug/L	2	206-44-0	1
Fluorene	37	5		ug/L	2	86-73-7	1
Hexachlorobenzene	38	5		ug/L	2	118-74-1	1
Hexachlorobutadiene	33	10		ug/L	2	87-68-3	1
Hexachlorocyclopentadiene*	39	5		ug/L	2	77-47-4	1
Hexachloroethane	29	5		ug/L	2	67-72-1	1
Indeno(1,2,3-cd)pyrene	36	2		ug/L	2	193-39-5	1
Isophorone	34	5		ug/L	2	78-59-1	1
2-Methylnaphthalene	34	5		ug/L	2	91-57-6	1
Naphthalene	34	5		ug/L	2	91-20-3	1
2-Nitroaniline	35	25		ug/L	2	88-74-4	1
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	1
4-Nitroaniline	32	25		ug/L	2	100-01-6	1
Nitrobenzene	31	5		ug/L	2	98-95-3	1
2-Nitrophenol	33	5		ug/L	2	88-75-5	1
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	1
N-Nitrosodiphenylamine	37	5		ug/L	2	86-30-6	1
N-Nitrosodi-n-propylamine	32	5		ug/L	2	621-64-7	1
Pentachlorophenol	29	5		ug/L	2	87-86-5	1
Phenanthrene	37	2		ug/L	2	85-01-8	1
Phenol	13	5		ug/L	2	108-95-2	1
Pyrene	37	5		ug/L	2	129-00-0	1
1,2,4-Trichlorobenzene	33	5		ug/L	2	120-82-1	1
2,4,5-Trichlorophenol	37	5		ug/L	2	95-95-4	1
2,4,6-Trichlorophenol	35	4		ug/L	2	88-06-2	1

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 13:08, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	55	1		ug/L	1	123-91-1	2

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:50, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	58	10		ug/L	1	60-29-7	2
Acetone	55	50		ug/L	1	67-64-1	2
Methyl iodide	46	1		ug/L	1	74-88-4	2
Carbon disulfide	42	5		ug/L	1	75-15-0	2
tert-Methyl butyl ether (MTBE)	49	5		ug/L	1	1634-04-4	2
Acrylonitrile	53	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	54	25		ug/L	1	78-93-3	2
Dichlorodifluoromethane	36	5		ug/L	1	75-71-8	2
Chloromethane	48	5		ug/L	1	74-87-3	2
Vinyl chloride	46	1		ug/L	1	75-01-4	2

1-Sample spiked at 0.050 mg/l
2-Spiked at 50ug/L

Lab Sample ID: S45491.10 (continued)
Sample Tag: MW-21-140_021623 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:50, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bromomethane	50	5		ug/L	1	74-83-9	1
Chloroethane	52	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	43	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	44	1		ug/L	1	75-35-4	1
Methylene chloride	48	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	45	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	46	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	46	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	46	1		ug/L	1	67-66-3	1
Bromochloromethane	47	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	43	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	52	50		ug/L	1	591-78-6	1
Carbon tetrachloride	39	1		ug/L	1	56-23-5	1
Benzene	44	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	45	1		ug/L	1	107-06-2	1
Trichloroethene	42	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	46	1		ug/L	1	78-87-5	1
Bromodichloromethane	45	1		ug/L	1	75-27-4	1
Dibromomethane	47	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	46	1		ug/L	1	10061-01-5	1
Toluene	44	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	45	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	48	1		ug/L	1	79-00-5	1
Tetrachloroethene	42	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	40	1		ug/L	1	110-57-6	1
Dibromochloromethane	44	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	46	1		ug/L	1	106-93-4	1
Chlorobenzene	44	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	44	1		ug/L	1	630-20-6	1
Ethylbenzene	44	1		ug/L	1	100-41-4	1
p,m-Xylene*	86	2		ug/L	1		1
o-Xylene	44	1		ug/L	1	95-47-6	1
Styrene	44	1		ug/L	1	100-42-5	1
Isopropylbenzene	43	5		ug/L	1	98-82-8	1
Bromoform	44	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	49	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	48	1		ug/L	1	96-18-4	1
n-Propylbenzene	43	1		ug/L	1	103-65-1	1
Bromobenzene	46	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	43	1		ug/L	1	108-67-8	1
tert-Butylbenzene	42	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	44	1		ug/L	1	95-63-6	1
sec-Butylbenzene	43	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	43	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	45	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	45	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	45	1		ug/L	1	95-50-1	1

1-Spiked at 50ug/L

Lab Sample ID: S45491.10 (continued)
Sample Tag: MW-21-140_021623 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 23:50, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,3-Trimethylbenzene	45	1		ug/L	1	526-73-8	1
n-Butylbenzene	44	1		ug/L	1	104-51-8	1
Hexachloroethane	41	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	49	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	47	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	49	5		ug/L	1	87-61-6	1
Naphthalene	49	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	50	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S45491.11
Sample Tag: MW-16-78_021623
Collected Date/Time: 02/16/2023 11:20
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR
2	1L Amber	None	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	
BNA Extraction	Completed	SW3510C	02/22/23 13:30	JWR	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 01:10, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S45491.11 (continued)
Sample Tag: MW-16-78_021623

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 01:10, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene*	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 18:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S45491.11 (continued)
Sample Tag: MW-16-78_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:19, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S45491.11 (continued)

Sample Tag: MW-16-78_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:19, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.12
Sample Tag: DUP-02_021623
Collected Date/Time: 02/16/2023 00:01
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR
2	1L Amber	None	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	
BNA Extraction	Completed	SW3510C	02/22/23 13:30	JWR	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 01:40, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S45491.12 (continued)
Sample Tag: DUP-02_021623

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/24/23 01:40, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene*	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 19:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S45491.12 (continued)
Sample Tag: DUP-02_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S45491.12 (continued)

Sample Tag: DUP-02_021623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 20:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S45491.13
Sample Tag: Trip Blank
Collected Date/Time: 02/15/2023 00:01
Matrix: Water
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/21/23 08:45	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 21:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S45491.13 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/20/23 21:06, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S45491.14
Sample Tag: MW-19-123_021623
Collected Date/Time: 02/16/2023 12:55
Matrix: Groundwater
COC Reference: 152333

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 14:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	26	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S45491.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S45491.01-S45491.14
Project: 30112892 / RACER Lansing
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30112892

QC Report Sections

Cover Page (Page 43)
Analysis Summary (Pages 44-57)
Prep Batch Summary (Pages 58-59)
Surrogates per Lab Sample (Pages 60-68)
Surrogates per QC Sample (Pages 69-76)
Internal Standards per Lab Sample (Pages 77-88)
Internal Standards per QC Sample (Pages 89-96)
Batch QC Results (Pages 97-121)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S45491.01
Sample Tag: MW-22-156_021523
Collected Date/Time: 02/15/2023 10:15
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/24/23 17:20	230224A9	VS230224W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 17:59	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List (Replicate 01)	SW5030C/8260C	02/24/23 13:26	230223C7	VF230223W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S45491.02
Sample Tag: MW-22-153_021523
Collected Date/Time: 02/15/2023 11:10
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/24/23 17:42	230224A9	VS230224W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 18:22	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.03
Sample Tag: MW-22-155_021523
Collected Date/Time: 02/15/2023 12:20
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/24/23 18:04	230224A9	VS230224W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 18:46	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.04

Sample Tag: MW-14-58R_021523

Collected Date/Time: 02/15/2023 13:25

Matrix: Groundwater

COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/24/23 18:25	230224A9	VS230224W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:09	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.05

Sample Tag: DUP-01_021523

Collected Date/Time: 02/15/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/24/23 18:47	230224A9	VS230224W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:32	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.06
Sample Tag: MW-22-157_021523
Collected Date/Time: 02/15/2023 14:30
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 14:16	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45491.07
Sample Tag: MW-21-139_021523
Collected Date/Time: 02/15/2023 15:55
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 18:08	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S45491.08
Sample Tag: MW-21-140_021623
Collected Date/Time: 02/16/2023 09:20
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/23/23 23:41	P230223B	SF230222W1	Yes	BLK/LCS/LCSD/MS/MS
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 15:13	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:56	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.09

Sample Tag: MW-21-140_021623 MS

Collected Date/Time: 02/16/2023 09:20

Matrix: Groundwater

COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 00:11	P230223B	SF230222W1	Yes	BLK/LCS/LCSD/MS/MS
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 12:48	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 23:27	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.10

Sample Tag: MW-21-140_021623 MSD

Collected Date/Time: 02/16/2023 09:20

Matrix: Groundwater

COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 00:41	P230223B	SF230222W1	Yes	BLK/LCS/LCSD/MS/MS
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 13:08	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 23:50	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.11
Sample Tag: MW-16-78_021623
Collected Date/Time: 02/16/2023 11:20
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 01:10	P230223B	SF230222W1	Yes	BLK/LCS/LCSD/MS/MS
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 18:51	230227A9	VS230227W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 20:19	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.12

Sample Tag: DUP-02_021623

Collected Date/Time: 02/16/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 01:40	P230223B	SF230222W1	Yes	BLK/LCS/LCSD/MS/MS
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 19:13	230227A9	VS230227W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 20:43	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.13
Sample Tag: Trip Blank
Collected Date/Time: 02/15/2023 00:01
Matrix: Water
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 21:06	230220A7	VF230220W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45491.14
Sample Tag: MW-19-123_021623
Collected Date/Time: 02/16/2023 12:55
Matrix: Groundwater
COC Reference: 152333

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 14:38	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.08	Semi-Volatile Organics - MDEQ	SW8270D	02/23/23 23:41	P230223B
S45491.09	Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 00:11	P230223B
S45491.10	Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 00:41	P230223B
S45491.11	Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 01:10	P230223B
S45491.12	Semi-Volatile Organics - MDEQ	SW8270D	02/24/23 01:40	P230223B

Organics - Volatiles, Prep Batch ID: VF230220W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.01	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 17:59	230220A7
S45491.02	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 18:22	230220A7
S45491.03	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 18:46	230220A7
S45491.04	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:09	230220A7
S45491.05	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:32	230220A7
S45491.08	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 19:56	230220A7
S45491.09	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 23:27	230220A7
S45491.10	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 23:50	230220A7
S45491.11	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 20:19	230220A7
S45491.12	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 20:43	230220A7
S45491.13	Volatile Organics - DEQ List	SW5030C/8260C	02/20/23 21:06	230220A7

Organics - Volatiles, Prep Batch ID: VF230223W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.01	Volatile Organics - DEQ List (Replicate 01)	SW5030C/8260C	02/24/23 13:26	230223C7

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.06	1,4-Dioxane	SW8260B - SIM	02/23/23 14:16	230223A9
S45491.14	1,4-Dioxane	SW8260B - SIM	02/23/23 14:38	230223A9

Organics - Volatiles, Prep Batch ID: VS230224W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.01	1,4-Dioxane	SW8260B - SIM	02/24/23 17:20	230224A9
S45491.02	1,4-Dioxane	SW8260B - SIM	02/24/23 17:42	230224A9
S45491.03	1,4-Dioxane	SW8260B - SIM	02/24/23 18:04	230224A9
S45491.04	1,4-Dioxane	SW8260B - SIM	02/24/23 18:25	230224A9
S45491.05	1,4-Dioxane	SW8260B - SIM	02/24/23 18:47	230224A9

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.07	1,4-Dioxane	SW8260B - SIM	02/27/23 18:08	230227A9
S45491.11	1,4-Dioxane	SW8260B - SIM	02/27/23 18:51	230227A9
S45491.12	1,4-Dioxane	SW8260B - SIM	02/27/23 19:13	230227A9

Organics - Volatiles, Prep Batch ID: VS230228W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45491.08	1,4-Dioxane	SW8260B - SIM	02/28/23 15:13	230228A9
S45491.09	1,4-Dioxane	SW8260B - SIM	02/28/23 12:48	230228A9
S45491.10	1,4-Dioxane	SW8260B - SIM	02/28/23 13:08	230228A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.01

Sample Tag: MW-22-156_021523

Collected Date/Time: 02/15/2023 10:15

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 17:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**108.5**	80.0	124.0
1,2-Dichloroethane-D4		**110.2**	72.0	125.0
Toluene-D8		**109.8**	89.0	112.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List (Replicate 01)

Run in Batch: 230223C7, Run Date: 02/24/2023 13:26, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**111.7**	80.0	124.0
1,2-Dichloroethane-D4		**110.5**	72.0	125.0
Toluene-D8		**109.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.02

Sample Tag: MW-22-153_021523

Collected Date/Time: 02/15/2023 11:10

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 18:22, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**107.9**	80.0	124.0
1,2-Dichloroethane-D4		**112.0**	72.0	125.0
Toluene-D8		**108.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.03

Sample Tag: MW-22-155_021523

Collected Date/Time: 02/15/2023 12:20

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 18:46, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**108.3**	80.0	124.0
1,2-Dichloroethane-D4		**114.5**	72.0	125.0
Toluene-D8		**109.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.04

Sample Tag: MW-14-58R_021523

Collected Date/Time: 02/15/2023 13:25

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.9**	80.0	124.0
1,2-Dichloroethane-D4		**106.9**	72.0	125.0
Toluene-D8		**108.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.05

Sample Tag: DUP-01_021523

Collected Date/Time: 02/15/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:32, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**108.8**	80.0	124.0
1,2-Dichloroethane-D4		**109.9**	72.0	125.0
Toluene-D8		**110.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.08

Sample Tag: MW-21-140_021623

Collected Date/Time: 02/16/2023 09:20

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/23/2023 23:41, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**37.9**	10.0	110.0
Phenol-D5		**30.2**	10.0	110.0
Nitrobenzene-D5		**64.3**	10.0	114.0
2-Fluorobiphenyl		**74.1**	10.0	116.0
2,4,6-Tribromophenol		**77.6**	10.0	123.0
Terphenyl-D14		**78.7**	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:56, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**110.1**	80.0	124.0
1,2-Dichloroethane-D4		**115.1**	72.0	125.0
Toluene-D8		**108.9**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.11

Sample Tag: MW-16-78_021623

Collected Date/Time: 02/16/2023 11:20

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/24/2023 01:10, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**36.8**	10.0	110.0
Phenol-D5		**29.2**	10.0	110.0
Nitrobenzene-D5		**65.3**	10.0	114.0
2-Fluorobiphenyl		**72.1**	10.0	116.0
2,4,6-Tribromophenol		**74.6**	10.0	123.0
Terphenyl-D14		**75.9**	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 20:19, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**108.6**	80.0	124.0
1,2-Dichloroethane-D4		**112.3**	72.0	125.0
Toluene-D8		**109.3**	89.0	112.0

Lab Sample ID: S45491.12

Sample Tag: DUP-02_021623

Collected Date/Time: 02/16/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/24/2023 01:40, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**37.7**	10.0	110.0
Phenol-D5		**29.7**	10.0	110.0
Nitrobenzene-D5		**64.2**	10.0	114.0
2-Fluorobiphenyl		**70.8**	10.0	116.0
2,4,6-Tribromophenol		**74.7**	10.0	123.0
Terphenyl-D14		**76.5**	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 20:43, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**107.9**	80.0	124.0
1,2-Dichloroethane-D4		**112.0**	72.0	125.0
Toluene-D8		**108.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S45491.13

Sample Tag: Trip Blank

Collected Date/Time: 02/15/2023 00:01

Matrix: Water

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 21:06, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**109.5**	80.0	124.0
1,2-Dichloroethane-D4		**116.0**	72.0	125.0
Toluene-D8		**109.8**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: P230223B.BLKW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**37.6**	10.0	110.0
Phenol-D5		**29.9**	10.0	110.0
Nitrobenzene-D5		**62.6**	10.0	114.0
2-Fluorobiphenyl		**65.5**	10.0	116.0
2,4,6-Tribromophenol		**74.9**	10.0	123.0
Terphenyl-D14		**70.8**	10.0	141.0

Blank (BLK)

Lab Sample ID: P230223C.BLKW22A

Run in Batch: P230223C, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**43.8**	10.0	110.0
Phenol-D5		**36.8**	10.0	110.0
Nitrobenzene-D5		**67.3**	10.0	114.0
2-Fluorobiphenyl		**73.9**	10.0	116.0
2,4,6-Tribromophenol		**83.4**	10.0	123.0
Terphenyl-D14		**74.3**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P230223C.LCSW22A

Run in Batch: P230223C, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P230223B.LCSDW22A, Parent Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**42.6**	10.0	110.0
Phenol-D5		**35.2**	10.0	110.0
Nitrobenzene-D5		**67.4**	10.0	114.0
2-Fluorobiphenyl		**74.7**	10.0	116.0
2,4,6-Tribromophenol		**82.7**	10.0	123.0
Terphenyl-D14		**73.3**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P230223C.LCSDW22A, Parent Sample ID: P230223C.LCSW22A

Run in Batch: P230223C, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Matrix Spike (MS)

Lab Sample ID: P230223B.4549109M, Parent Sample ID: S45491.08

Run in Batch: P230223B, Run Date: 02/24/2023 00:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**38.7**	10.0	110.0
Phenol-D5		**31.0**	10.0	110.0
Nitrobenzene-D5		**69.3**	10.0	114.0
2-Fluorobiphenyl		**76.3**	10.0	116.0
2,4,6-Tribromophenol		**77.1**	10.0	123.0
Terphenyl-D14		**78.5**	10.0	141.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: P230223B.4549110N, Parent Sample ID: P230223B.4549109M

Run in Batch: P230223B, Run Date: 02/24/2023 00:41, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**38.9**	10.0	110.0
Phenol-D5		**31.8**	10.0	110.0
Nitrobenzene-D5		**69.5**	10.0	114.0
2-Fluorobiphenyl		**78.0**	10.0	116.0
2,4,6-Tribromophenol		**83.0**	10.0	123.0
Terphenyl-D14		**84.2**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF230220W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230220A7.BLKW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 15:20, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.9**	80.0	124.0
1,2-Dichloroethane-D4		**114.4**	72.0	125.0
Toluene-D8		**109.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 13:46, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**110.6**	80.0	124.0
1,2-Dichloroethane-D4		**107.1**	72.0	125.0
Toluene-D8		**109.4**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230220A7.LCSDW20A, Parent Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 14:09, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**110.5**	80.0	124.0
1,2-Dichloroethane-D4		**111.8**	72.0	125.0
Toluene-D8		**109.5**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 230220A7.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230220A7, Run Date: 02/20/2023 23:27, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**108.5**	80.0	124.0
1,2-Dichloroethane-D4		**116.4**	72.0	125.0
Toluene-D8		**109.9**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230220A7.4549110N, Parent Sample ID: 230220A7.4549109M

Run in Batch: 230220A7, Run Date: 02/20/2023 23:50, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**109.7**	80.0	124.0
1,2-Dichloroethane-D4		**114.7**	72.0	125.0
Toluene-D8		**109.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230223W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223C7.BLKW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 05:58, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**109.6**	80.0	124.0
1,2-Dichloroethane-D4		**104.3**	72.0	125.0
Toluene-D8		**108.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:24, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**109.2**	80.0	124.0
1,2-Dichloroethane-D4		**105.9**	72.0	125.0
Toluene-D8		**108.9**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223C7.LCSDW23C, Parent Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:48, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**108.8**	80.0	124.0
1,2-Dichloroethane-D4		**109.5**	72.0	125.0
Toluene-D8		**109.9**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230224W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230224A9.BLKW24A

Run in Batch: 230224A9, Run Date: 02/24/2023 16:38, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:12, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230224A9.LCSD24A, Parent Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:33, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230228W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.01

Sample Tag: MW-22-156_021523

Collected Date/Time: 02/15/2023 10:15

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230224A9, Run Date: 02/24/2023 17:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.0**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 17:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**90.7**	50.0	200.0
1,4-Difluorobenzene		**94.9**	50.0	200.0
Chlorobenzene-D5		**95.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**94.3**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List (Replicate 01)

Run in Batch: 230223C7, Run Date: 02/24/2023 13:26, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.7**	50.0	200.0
1,4-Difluorobenzene		**100.5**	50.0	200.0
Chlorobenzene-D5		**100.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.02

Sample Tag: MW-22-153_021523

Collected Date/Time: 02/15/2023 11:10

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230224A9, Run Date: 02/24/2023 17:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 18:22, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**94.2**	50.0	200.0
1,4-Difluorobenzene		**99.7**	50.0	200.0
Chlorobenzene-D5		**101.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.03

Sample Tag: MW-22-155_021523

Collected Date/Time: 02/15/2023 12:20

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230224A9, Run Date: 02/24/2023 18:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.7**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 18:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**94.6**	50.0	200.0
1,4-Difluorobenzene		**99.8**	50.0	200.0
Chlorobenzene-D5		**102.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.04

Sample Tag: MW-14-58R_021523

Collected Date/Time: 02/15/2023 13:25

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230224A9, Run Date: 02/24/2023 18:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.9**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**90.1**	50.0	200.0
1,4-Difluorobenzene		**95.2**	50.0	200.0
Chlorobenzene-D5		**93.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.9**	50.0	200.0

Lab Sample ID: S45491.05

Sample Tag: DUP-01_021523

Collected Date/Time: 02/15/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230224A9, Run Date: 02/24/2023 18:47, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:32, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**90.7**	50.0	200.0
1,4-Difluorobenzene		**95.4**	50.0	200.0
Chlorobenzene-D5		**95.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.06

Sample Tag: MW-22-157_021523

Collected Date/Time: 02/15/2023 14:30

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 14:16, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.07

Sample Tag: MW-21-139_021523

Collected Date/Time: 02/15/2023 15:55

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 18:08, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.08

Sample Tag: MW-21-140_021623

Collected Date/Time: 02/16/2023 09:20

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/23/2023 23:41, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**83.6**	50.0	200.0
Naphthalene-D8		**82.8**	50.0	200.0
Acenaphthalene-D10		**82.6**	50.0	200.0
Phenanthrene-D10		**81.4**	50.0	200.0
Chrysene-D12		**81.9**	50.0	200.0
Perylene-D12		**83.8**	50.0	200.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230228A9, Run Date: 02/28/2023 15:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**83.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 19:56, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.5**	50.0	200.0
1,4-Difluorobenzene		**102.3**	50.0	200.0
Chlorobenzene-D5		**103.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.11

Sample Tag: MW-16-78_021623

Collected Date/Time: 02/16/2023 11:20

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/24/2023 01:10, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**89.2**	50.0	200.0
Naphthalene-D8		**87.3**	50.0	200.0
Acenaphthalene-D10		**87.7**	50.0	200.0
Phenanthrene-D10		**85.4**	50.0	200.0
Chrysene-D12		**86.0**	50.0	200.0
Perylene-D12		**88.1**	50.0	200.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 18:51, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.2**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 20:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**92.9**	50.0	200.0
1,4-Difluorobenzene		**98.2**	50.0	200.0
Chlorobenzene-D5		**98.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.12

Sample Tag: DUP-02_021623

Collected Date/Time: 02/16/2023 00:01

Matrix: Groundwater

COC Reference: 152333

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P230223B, Run Date: 02/24/2023 01:40, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**85.6**	50.0	200.0
Naphthalene-D8		**84.6**	50.0	200.0
Acenaphthalene-D10		**84.6**	50.0	200.0
Phenanthrene-D10		**84.0**	50.0	200.0
Chrysene-D12		**84.2**	50.0	200.0
Perylene-D12		**83.4**	50.0	200.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 19:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 20:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.4**	50.0	200.0
1,4-Difluorobenzene		**99.4**	50.0	200.0
Chlorobenzene-D5		**100.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.13

Sample Tag: Trip Blank

Collected Date/Time: 02/15/2023 00:01

Matrix: Water

COC Reference: 152333

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230220A7, Run Date: 02/20/2023 21:06, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**93.8**	50.0	200.0
1,4-Difluorobenzene		**99.6**	50.0	200.0
Chlorobenzene-D5		**103.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45491.14

Sample Tag: MW-19-123_021623

Collected Date/Time: 02/16/2023 12:55

Matrix: Groundwater

COC Reference: 152333

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 14:38, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.8**	50.0	200.0

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: P230223B.BLKW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**95.8**	50.0	200.0
Naphthalene-D8		**93.0**	50.0	200.0
Acenaphthalene-D10		**94.0**	50.0	200.0
Phenanthrene-D10		**91.6**	50.0	200.0
Chrysene-D12		**94.9**	50.0	200.0
Perylene-D12		**92.8**	50.0	200.0

Blank (BLK)

Lab Sample ID: P230223C.BLKW22A

Run in Batch: P230223C, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**103.0**	50.0	200.0
Naphthalene-D8		**98.9**	50.0	200.0
Acenaphthalene-D10		**99.8**	50.0	200.0
Phenanthrene-D10		**99.8**	50.0	200.0
Chrysene-D12		**102.1**	50.0	200.0
Perylene-D12		**96.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**94.5**	50.0	200.0
Naphthalene-D8		**94.0**	50.0	200.0
Acenaphthalene-D10		**92.4**	50.0	200.0
Phenanthrene-D10		**92.7**	50.0	200.0
Chrysene-D12		**93.3**	50.0	200.0
Perylene-D12		**98.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: P230223C.LCSW22A

Run in Batch: P230223C, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**107.8**	50.0	200.0
Naphthalene-D8		**100.2**	50.0	200.0
Acenaphthalene-D10		**101.4**	50.0	200.0
Phenanthrene-D10		**100.9**	50.0	200.0
Chrysene-D12		**100.3**	50.0	200.0
Perylene-D12		**102.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P230223B.LCSDW22A, Parent Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**91.2**	50.0	200.0
Naphthalene-D8		**89.5**	50.0	200.0
Acenaphthalene-D10		**88.8**	50.0	200.0
Phenanthrene-D10		**89.3**	50.0	200.0
Chrysene-D12		**88.1**	50.0	200.0
Perylene-D12		**91.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P230223C.LCSDW22A, Parent Sample ID: P230223C.LCSW22A

Run in Batch: P230223C, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**104.3**	50.0	200.0
Naphthalene-D8		**95.4**	50.0	200.0
Acenaphthalene-D10		**95.5**	50.0	200.0
Phenanthrene-D10		**97.2**	50.0	200.0
Chrysene-D12		**94.9**	50.0	200.0
Perylene-D12		**95.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: P230223B.4549109M, Parent Sample ID: S45491.08

Run in Batch: P230223B, Run Date: 02/24/2023 00:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**96.2**	50.0	200.0
Naphthalene-D8		**92.9**	50.0	200.0
Acenaphthalene-D10		**94.6**	50.0	200.0
Phenanthrene-D10		**91.9**	50.0	200.0
Chrysene-D12		**93.3**	50.0	200.0
Perylene-D12		**94.0**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: P230223B.4549110N, Parent Sample ID: P230223B.4549109M

Run in Batch: P230223B, Run Date: 02/24/2023 00:41, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		**90.1**	50.0	200.0
Naphthalene-D8		**88.4**	50.0	200.0
Acenaphthalene-D10		**88.7**	50.0	200.0
Phenanthrene-D10		**86.1**	50.0	200.0
Chrysene-D12		**87.5**	50.0	200.0
Perylene-D12		**91.0**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230220W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230220A7.BLKW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 15:20, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.1**	50.0	200.0
1,4-Difluorobenzene		**105.7**	50.0	200.0
Chlorobenzene-D5		**106.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**107.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 13:46, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**102.8**	50.0	200.0
1,4-Difluorobenzene		**103.5**	50.0	200.0
Chlorobenzene-D5		**104.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**104.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230220A7.LCSDW20A, Parent Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 14:09, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.6**	50.0	200.0
1,4-Difluorobenzene		**102.8**	50.0	200.0
Chlorobenzene-D5		**104.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**104.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230220A7.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230220A7, Run Date: 02/20/2023 23:27, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**92.2**	50.0	200.0
1,4-Difluorobenzene		**97.2**	50.0	200.0
Chlorobenzene-D5		**98.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.6**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230220A7.4549110N, Parent Sample ID: 230220A7.4549109M

Run in Batch: 230220A7, Run Date: 02/20/2023 23:50, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**94.7**	50.0	200.0
1,4-Difluorobenzene		**98.2**	50.0	200.0
Chlorobenzene-D5		**99.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**99.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230223W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223C7.BLKW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 05:58, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.7**	50.0	200.0
1,4-Difluorobenzene		**97.8**	50.0	200.0
Chlorobenzene-D5		**95.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:24, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.2**	50.0	200.0
1,4-Difluorobenzene		**99.8**	50.0	200.0
Chlorobenzene-D5		**100.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223C7.LCSDW23C, Parent Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:48, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.1**	50.0	200.0
1,4-Difluorobenzene		**100.1**	50.0	200.0
Chlorobenzene-D5		**100.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**106.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230224W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230224A9.BLKW24A

Run in Batch: 230224A9, Run Date: 02/24/2023 16:38, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:12, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**89.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230224A9.LCSD24A, Parent Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:33, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**76.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**89.9**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230228W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**71.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**86.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**77.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**71.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**68.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**78.9**	50.0	200.0

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: P230223B.BLKW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00050	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate		ND	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: P230223B.BLKW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		64.5	27	111
Acenaphthylene		65.8	16	116
Anthracene		63.9	31	119
Benzo(a)anthracene		65.2	35	119
Benzo(b)fluoranthene		66.3	27	129
Benzo(k)fluoranthene		61.1	36	120
Benzo(ghi)perylene		63.0	31	126
Benzo(a)pyrene		62.3	32	121
bis(2-Chloroethoxy)methane		61.2	23	106
bis(2-Chloroethyl)ether		57.9	29	94
bis(2-Chloroisopropyl)ether		51.8	23	91
bis(2-Ethylhexyl)phthalate		63.9	35	121
4-Bromophenyl phenyl ether		68.0	27	122
Butyl benzyl phthalate		65.9	36	117
4-Chloroaniline		37.0	19	91
2-Chloronaphthalene		63.4	21	109
4-Chloro-3-methylphenol		63.6	36	105
2-Chlorophenol		57.3	24	94
4-Chlorophenyl phenyl ether		67.0	31	114
Chrysene		61.4	34	119
3-, 4-Methylphenol (p,m-Cresol)		51.6	21	90
2-Methylphenol (o-Cresol)		52.7	23	79
Dibenzo(ah)anthracene		64.5	32	119

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 22:42, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		67.5	29	115
di-n-Butyl phthalate		68.2	34	121
1,2-Dichlorobenzene		49.8	11	88
1,3-Dichlorobenzene		47.5	10	85
1,4-Dichlorobenzene		48.0	10	85
3,3'-Dichlorobenzidine		49.8	27	110
2,4-Dichlorophenol		63.5	33	106
Diethyl phthalate		66.8	36	116
2,4-Dimethylphenol		62.0	30	105
Dimethyl phthalate		67.3	35	116
4,6-Dinitro-2-methylphenol		60.8	19	116
2,4-Dinitrophenol		48.0	10	125
2,4-Dinitrotoluene		69.9	33	119
2,6-Dinitrotoluene		68.3	34	117
1,2-Diphenylhydrazine		63.8	34	113
di-n-Octyl phthalate		67.1	30	133
Fluoranthene		66.6	35	121
Fluorene		64.8	32	114
Hexachlorobenzene		64.3	26	126
Hexachlorobutadiene		52.2	10	95
Hexachlorocyclopentadiene		68.4	10	90
Hexachloroethane		44.2	10	82
Indeno(1,2,3-cd)pyrene		64.3	31	124
Isophorone		61.7	26	104
2-Methylnaphthalene		60.2	21	103
Naphthalene		57.8	21	99
2-Nitroaniline		67.2	34	111
3-Nitroaniline		43.8	34	111
4-Nitroaniline		60.5	34	100
Nitrobenzene		57.7	30	98
2-Nitrophenol		62.3	31	108
4-Nitrophenol		43.1	10	90
N-Nitrosodiphenylamine		65.1	31	120
N-Nitrosodi-n-propylamine		60.9	33	102
Pentachlorophenol		56.7	10	108
Phenanthrene		61.6	35	113
Phenol		30.9	10	43
Pyrene		66.1	33	120
1,2,4-Trichlorobenzene		55.2	10	98
2,4,5-Trichlorophenol		67.3	31	120
2,4,6-Trichlorophenol		67.3	31	114

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P230223B.LCSDW22A, Parent Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		68.1	27	111	5.4	30.0
Acenaphthylene		69.3	16	116	5.2	30.0
Anthracene		67.7	31	119	5.7	30.0
Benzo(a)anthracene		69.8	35	119	6.9	30.0
Benzo(b)fluoranthene		69.3	27	129	4.3	30.0
Benzo(k)fluoranthene		69.9	36	120	13.5	30.0
Benzo(ghi)perylene		69.3	31	126	9.5	30.0
Benzo(a)pyrene		70.7	32	121	12.6	30.0
bis(2-Chloroethoxy)methane		64.2	23	106	4.8	30.0
bis(2-Chloroethyl)ether		60.7	29	94	4.8	30.0
bis(2-Chloroisopropyl)ether		51.2	23	91	1.0	30.0
bis(2-Ethylhexyl)phthalate		68.0	35	121	6.3	30.0
4-Bromophenyl phenyl ether		69.4	27	122	2.1	30.0
Butyl benzyl phthalate		70.0	36	117	6.0	30.0
4-Chloroaniline		36.9	19	91	0.2	30.0
2-Chloronaphthalene		64.9	21	109	2.4	30.0
4-Chloro-3-methylphenol		66.7	36	105	4.7	30.0
2-Chlorophenol		58.2	24	94	1.5	30.0
4-Chlorophenyl phenyl ether		70.5	31	114	5.1	30.0
Chrysene		66.8	34	119	8.5	30.0
3-, 4-Methylphenol (p,m-Cresol)		52.4	21	90	1.5	30.0
2-Methylphenol (o-Cresol)		53.8	23	79	2.1	30.0
Dibenzo(ah)anthracene		70.8	32	119	9.3	30.0
Dibenzofuran		69.2	29	115	2.5	30.0
di-n-Butyl phthalate		71.1	34	121	4.1	30.0
1,2-Dichlorobenzene		51.0	11	88	2.5	30.0
1,3-Dichlorobenzene		48.7	10	85	2.5	30.0
1,4-Dichlorobenzene		49.4	10	85	3.0	30.0
3,3'-Dichlorobenzidine		55.4	27	110	10.5	30.0
2,4-Dichlorophenol		66.7	33	106	5.0	30.0
Diethyl phthalate		69.5	36	116	4.0	30.0
2,4-Dimethylphenol		63.9	30	105	2.9	30.0
Dimethyl phthalate		70.0	35	116	3.9	30.0
4,6-Dinitro-2-methylphenol		62.8	19	116	3.2	30.0
2,4-Dinitrophenol		52.3	10	125	8.6	30.0
2,4-Dinitrotoluene		72.7	33	119	3.9	30.0
2,6-Dinitrotoluene		71.2	34	117	4.1	30.0
1,2-Diphenylhydrazine		66.9	34	113	4.8	30.0
di-n-Octyl phthalate		72.6	30	133	7.9	30.0
Fluoranthene		68.9	35	121	3.5	30.0
Fluorene		67.7	32	114	4.4	30.0
Hexachlorobenzene		68.8	26	126	6.7	30.0
Hexachlorobutadiene		54.8	10	95	4.8	30.0
Hexachlorocyclopentadiene		70.5	10	90	3.1	30.0
Hexachloroethane		45.0	10	82	1.8	30.0
Indeno(1,2,3-cd)pyrene		71.8	31	124	11.1	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P230223B.LCSDW22A, Parent Sample ID: P230223B.LCSW22A

Run in Batch: P230223B, Run Date: 02/23/2023 23:12, Prep Date: 02/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		65.0	26	104	5.1	30.0
2-Methylnaphthalene		62.9	21	103	4.4	30.0
Naphthalene		60.7	21	99	5.0	30.0
2-Nitroaniline		71.6	34	111	6.5	30.0
3-Nitroaniline		44.6	34	111	1.9	30.0
4-Nitroaniline		63.5	34	100	4.7	30.0
Nitrobenzene		59.7	30	98	3.4	30.0
2-Nitrophenol		65.3	31	108	4.7	30.0
4-Nitrophenol		42.3	10	90	1.7	30.0
N-Nitrosodiphenylamine		68.5	31	120	5.0	30.0
N-Nitrosodi-n-propylamine		62.6	33	102	2.7	30.0
Pentachlorophenol		59.7	10	108	5.1	30.0
Phenanthrene		65.0	35	113	5.4	30.0
Phenol		30.8	10	43	0.4	30.0
Pyrene		69.6	33	120	5.2	30.0
1,2,4-Trichlorobenzene		57.5	10	98	4.0	30.0
2,4,5-Trichlorophenol		70.7	31	120	4.9	30.0
2,4,6-Trichlorophenol		69.9	31	114	3.8	30.0

Matrix Spike (MS)

Lab Sample ID: P230223B.4549109M, Parent Sample ID: S45491.08

Run in Batch: P230223B, Run Date: 02/24/2023 00:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		64.9	27	111
Acenaphthylene		66.2	16	116
Anthracene		67.7	31	119
Benzo(a)anthracene		66.5	35	119
Benzo(b)fluoranthene		70.4	27	129
Benzo(k)fluoranthene		67.1	36	120
Benzo(ghi)perylene		63.8	31	126
Benzo(a)pyrene		67.2	32	121
bis(2-Chloroethoxy)methane		61.8	23	106
bis(2-Chloroethyl)ether		57.5	29	94
bis(2-Chloroisopropyl)ether		53.1	23	91
bis(2-Ethylhexyl)phthalate		64.9	35	121
4-Bromophenyl phenyl ether		68.3	27	122
Butyl benzyl phthalate		65.4	36	117
4-Chloroaniline		42.1	19	91
2-Chloronaphthalene		63.8	21	109
4-Chloro-3-methylphenol		62.2	36	105
2-Chlorophenol		53.2	24	94
4-Chlorophenyl phenyl ether		66.5	31	114
Chrysene		65.0	34	119
3-, 4-Methylphenol (p,m-Cresol)		46.4	21	90
2-Methylphenol (o-Cresol)		48.7	23	79
Dibenzo(ah)anthracene		65.8	32	119

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: P230223B.4549109M, Parent Sample ID: S45491.08

Run in Batch: P230223B, Run Date: 02/24/2023 00:11, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		66.2	29	115
di-n-Butyl phthalate		69.5	34	121
1,2-Dichlorobenzene		56.9	11	88
1,3-Dichlorobenzene		55.3	10	85
1,4-Dichlorobenzene		55.8	10	85
3,3'-Dichlorobenzidine		54.9	27	110
2,4-Dichlorophenol		62.6	33	106
Diethyl phthalate		66.4	36	116
2,4-Dimethylphenol		60.0	30	105
Dimethyl phthalate		66.3	35	116
4,6-Dinitro-2-methylphenol		58.5	19	116
2,4-Dinitrophenol		43.1	10	125
2,4-Dinitrotoluene		66.1	33	119
2,6-Dinitrotoluene		66.9	34	117
1,2-Diphenylhydrazine		64.9	34	113
di-n-Octyl phthalate		69.6	30	133
Fluoranthene		67.1	35	121
Fluorene		66.4	32	114
Hexachlorobenzene		66.4	26	126
Hexachlorobutadiene		63.8	10	95
Hexachlorocyclopentadiene		71.8	10	90
Hexachloroethane		54.5	10	82
Indeno(1,2,3-cd)pyrene		65.7	31	124
Isophorone		63.0	26	104
2-Methylnaphthalene		65.2	21	103
Naphthalene		63.1	21	99
2-Nitroaniline		64.1	34	111
3-Nitroaniline		50.0	34	111
4-Nitroaniline		59.0	34	100
Nitrobenzene		58.7	30	98
2-Nitrophenol		62.4	31	108
4-Nitrophenol		35.8	10	90
N-Nitrosodiphenylamine		67.7	31	120
N-Nitrosodi-n-propylamine		60.1	33	102
Pentachlorophenol		50.9	10	108
Phenanthrene		65.1	35	113
Phenol		25.3	10	43
Pyrene		66.6	33	120
1,2,4-Trichlorobenzene		63.0	10	98
2,4,5-Trichlorophenol		65.8	31	120
2,4,6-Trichlorophenol		63.3	31	114

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD)

Lab Sample ID: P230223B.4549110N, Parent Sample ID: P230223B.4549109M

Run in Batch: P230223B, Run Date: 02/24/2023 00:41, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		67.3	27	111	3.6	30.0
Acenaphthylene		68.8	16	116	3.8	30.0
Anthracene		71.9	31	119	6.0	30.0
Benzo(a)anthracene		71.4	35	119	7.1	30.0
Benzo(b)fluoranthene		74.8	27	129	6.1	30.0
Benzo(k)fluoranthene		70.6	36	120	5.0	30.0
Benzo(ghi)perylene		66.9	31	126	4.7	30.0
Benzo(a)pyrene		69.5	32	121	3.4	30.0
bis(2-Chloroethoxy)methane		62.8	23	106	1.6	30.0
bis(2-Chloroethyl)ether		58.8	29	94	2.3	30.0
bis(2-Chloroisopropyl)ether		53.9	23	91	1.4	30.0
bis(2-Ethylhexyl)phthalate		70.6	35	121	8.5	30.0
4-Bromophenyl phenyl ether		70.6	27	122	3.3	30.0
Butyl benzyl phthalate		70.0	36	117	6.8	30.0
4-Chloroaniline		38.1	19	91	10.0	30.0
2-Chloronaphthalene		65.4	21	109	2.4	30.0
4-Chloro-3-methylphenol		63.4	36	105	1.8	30.0
2-Chlorophenol		54.9	24	94	3.2	30.0
4-Chlorophenyl phenyl ether		69.8	31	114	4.8	30.0
Chrysene		69.4	34	119	6.4	30.0
3-, 4-Methylphenol (p,m-Cresol)		47.1	21	90	1.3	30.0
2-Methylphenol (o-Cresol)		50.8	23	79	4.1	30.0
Dibenzo(ah)anthracene		67.1	32	119	2.0	30.0
Dibenzofuran		68.7	29	115	3.7	30.0
di-n-Butyl phthalate		76.1	34	121	9.0	30.0
1,2-Dichlorobenzene		58.9	11	88	3.5	30.0
1,3-Dichlorobenzene		58.4	10	85	5.4	30.0
1,4-Dichlorobenzene		57.6	10	85	3.1	30.0
3,3'-Dichlorobenzidine		57.4	27	110	4.6	30.0
2,4-Dichlorophenol		64.8	33	106	3.4	30.0
Diethyl phthalate		71.3	36	116	7.1	30.0
2,4-Dimethylphenol		61.0	30	105	1.7	30.0
Dimethyl phthalate		69.6	35	116	4.9	30.0
4,6-Dinitro-2-methylphenol		65.1	19	116	10.7	30.0
2,4-Dinitrophenol		49.8	10	125	14.3	30.0
2,4-Dinitrotoluene		71.5	33	119	7.8	30.0
2,6-Dinitrotoluene		70.0	34	117	4.5	30.0
1,2-Diphenylhydrazine		69.0	34	113	6.2	30.0
di-n-Octyl phthalate		72.7	30	133	4.4	30.0
Fluoranthene		71.9	35	121	6.9	30.0
Fluorene		69.4	32	114	4.4	30.0
Hexachlorobenzene		72.1	26	126	8.2	30.0
Hexachlorobutadiene		62.5	10	95	2.0	30.0
Hexachlorocyclopentadiene		73.6	10	90	2.4	30.0
Hexachloroethane		55.7	10	82	2.3	30.0
Indeno(1,2,3-cd)pyrene		67.6	31	124	2.9	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF230222W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: P230223B.4549110N, Parent Sample ID: P230223B.4549109M

Run in Batch: P230223B, Run Date: 02/24/2023 00:41, Prep Date: 02/22/2023, Matrix: WW, Dilution: 2

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		63.7	26	104	1.1	30.0
2-Methylnaphthalene		63.8	21	103	2.3	30.0
Naphthalene		63.7	21	99	1.0	30.0
2-Nitroaniline		67.1	34	111	4.6	30.0
3-Nitroaniline		46.4	34	111	7.4	30.0
4-Nitroaniline		60.6	34	100	2.7	30.0
Nitrobenzene		59.7	30	98	1.6	30.0
2-Nitrophenol		62.4	31	108	0.1	30.0
4-Nitrophenol		37.6	10	90	4.9	30.0
N-Nitrosodiphenylamine		70.1	31	120	3.6	30.0
N-Nitrosodi-n-propylamine		61.4	33	102	2.2	30.0
Pentachlorophenol		55.1	10	108	7.9	30.0
Phenanthrene		70.0	35	113	7.2	30.0
Phenol		25.6	10	43	1.4	30.0
Pyrene		70.1	33	120	5.1	30.0
1,2,4-Trichlorobenzene		63.0	10	98	0.0	30.0
2,4,5-Trichlorophenol		69.9	31	120	5.9	30.0
2,4,6-Trichlorophenol		65.8	31	114	3.9	30.0

Organics - Volatiles, Prep Batch ID: VF230220W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230220A7.BLKW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 15:20, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 230220A7.BLKW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 15:20, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 13:46, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		108.4	67.4	121.2
Acetone		117.5	29.9	161.5
Methyl iodide		108.7	68.8	116.4
Carbon disulfide		98.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		113.8	73.2	122.4
Acrylonitrile		113.1	69.9	128.9
2-Butanone (MEK)		117.5	44.0	134.4
Dichlorodifluoromethane		85.4	10.0	222.8
Chloromethane		123.6	23.8	166.5
Vinyl chloride		113.4	43.5	149.1
Bromomethane		128.5	56.8	151.3
Chloroethane		126.0	53.4	149.4
Trichlorofluoromethane		103.7	59.7	151.8
1,1-Dichloroethene		100.9	69.6	139.4
Methylene chloride		111.2	73.3	121.1
trans-1,2-Dichloroethene		105.1	73.6	129.3
1,1-Dichloroethane		106.6	71.5	126.2
cis-1,2-Dichloroethene		109.2	76.6	122.1
Tetrahydrofuran		107.2	59.0	117.9
Chloroform		109.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 13:46, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		111.5	78.2	120.8
1,1,1-Trichloroethane		99.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		109.3	71.6	125.2
2-Hexanone		116.3	55.4	136.9
Carbon tetrachloride		94.7	72.6	133.0
Benzene		108.2	79.9	124.9
1,2-Dichloroethane		109.2	76.0	126.3
Trichloroethene		105.1	79.7	124.2
1,2-Dichloropropane		112.3	78.6	126.4
Bromodichloromethane		112.4	80.4	128.2
Dibromomethane		116.7	76.9	122.1
cis-1,3-Dichloropropene		116.2	79.8	129.9
Toluene		109.3	79.8	124.5
trans-1,3-Dichloropropene		115.3	74.0	131.3
1,1,2-Trichloroethane		115.6	78.7	123.1
Tetrachloroethene		107.2	74.5	124.5
trans-1,4-Dichloro-2-butene		94.0	68.6	135.4
Dibromochloromethane		112.4	74.6	127.2
1,2-Dibromoethane		113.3	70.3	133.7
Chlorobenzene		109.2	79.2	122.7
1,1,1,2-Tetrachloroethane		109.2	80.3	128.2
Ethylbenzene		108.9	79.5	129.1
p,m-Xylene		107.9	79.4	132.2
o-Xylene		109.3	80.2	131.0
Styrene		113.1	69.5	126.7
Isopropylbenzene		106.8	74.4	121.5
Bromoform		110.2	69.4	128.0
1,1,2,2-Tetrachloroethane		112.4	79.8	126.3
1,2,3-Trichloropropane		111.9	78.3	138.8
n-Propylbenzene		108.8	82.0	130.7
Bromobenzene		114.0	78.7	124.6
1,3,5-Trimethylbenzene		108.5	81.3	128.9
tert-Butylbenzene		107.0	80.7	128.9
1,2,4-Trimethylbenzene		109.3	81.4	130.8
sec-Butylbenzene		110.9	77.4	129.8
p-Isopropyltoluene		112.9	79.8	137.5
1,3-Dichlorobenzene		113.2	77.0	131.3
1,4-Dichlorobenzene		115.4	20.7	137.7
1,2-Dichlorobenzene		113.9	10.0	166.2
1,2,3-Trimethylbenzene		113.3	76.3	124.2
n-Butylbenzene		114.9	80.0	133.3
Hexachloroethane		110.9	23.8	138.1
1,2-Dibromo-3-chloropropane		111.5	21.2	189.4
1,2,4-Trichlorobenzene		121.8	27.4	143.4
1,2,3-Trichlorobenzene		124.5	75.4	131.4
Naphthalene		116.3	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 13:46, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		127.7	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230220A7.LCSDW20A, Parent Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 14:09, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		109.2	67.4	121.2	0.7	30.0
Acetone		97.9	29.9	161.5	18.2	30.0
Methyl iodide		90.7	68.8	116.4	18.0	30.0
Carbon disulfide		82.6	63.8	137.4	17.9	30.0
tert-Methyl butyl ether (MTBE)		95.1	73.2	122.4	17.9	30.0
Acrylonitrile		95.2	69.9	128.9	17.2	30.0
2-Butanone (MEK)		103.7	44.0	134.4	12.5	30.0
Dichlorodifluoromethane		67.5	10.0	222.8	23.4	30.0
Chloromethane		94.9	23.8	166.5	26.3	30.0
Vinyl chloride		86.2	43.5	149.1	27.3	30.0
Bromomethane		97.4	56.8	151.3	27.5	30.0
Chloroethane		98.6	53.4	149.4	24.4	30.0
Trichlorofluoromethane		81.9	59.7	151.8	23.4	30.0
1,1-Dichloroethene		101.5	69.6	139.4	0.6	30.0
Methylene chloride		93.0	73.3	121.1	17.9	30.0
trans-1,2-Dichloroethene		86.5	73.6	129.3	19.4	30.0
1,1-Dichloroethane		90.0	71.5	126.2	16.9	30.0
cis-1,2-Dichloroethene		90.6	76.6	122.1	18.7	30.0
Tetrahydrofuran		87.6	59.0	117.9	20.1	30.0
Chloroform		90.4	78.4	124.0	18.9	30.0
Bromochloromethane		93.2	78.2	120.8	17.9	30.0
1,1,1-Trichloroethane		82.0	79.4	130.9	19.1	30.0
4-Methyl-2-pentanone (MIBK)		91.7	71.6	125.2	17.5	30.0
2-Hexanone		93.0	55.4	136.9	22.3	30.0
Carbon tetrachloride		76.3	72.6	133.0	21.5	30.0
Benzene		88.2	79.9	124.9	20.3	30.0
1,2-Dichloroethane		89.7	76.0	126.3	19.6	30.0
Trichloroethene		84.6	79.7	124.2	21.6	30.0
1,2-Dichloropropane		92.7	78.6	126.4	19.2	30.0
Bromodichloromethane		91.9	80.4	128.2	20.1	30.0
Dibromomethane		93.4	76.9	122.1	22.2	30.0
cis-1,3-Dichloropropene		92.7	79.8	129.9	22.5	30.0
Toluene		88.8	79.8	124.5	20.7	30.0
trans-1,3-Dichloropropene		91.9	74.0	131.3	22.6	30.0
1,1,2-Trichloroethane		93.5	78.7	123.1	21.1	30.0
Tetrachloroethene		84.1	74.5	124.5	24.2	30.0
trans-1,4-Dichloro-2-butene		75.2	68.6	135.4	22.2	30.0
Dibromochloromethane		89.0	74.6	127.2	23.2	30.0
1,2-Dibromoethane		92.8	70.3	133.7	19.8	30.0
Chlorobenzene		87.8	79.2	122.7	21.8	30.0

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230220A7.LCSDW20A, Parent Sample ID: 230220A7.LCSW20A

Run in Batch: 230220A7, Run Date: 02/20/2023 14:09, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		89.7	80.3	128.2	19.6	30.0
Ethylbenzene		87.4	79.5	129.1	21.9	30.0
p,m-Xylene		87.4	79.4	132.2	21.0	30.0
o-Xylene		88.4	80.2	131.0	21.1	30.0
Styrene		90.5	69.5	126.7	22.2	30.0
Isopropylbenzene		86.6	74.4	121.5	20.9	30.0
Bromoform		90.1	69.4	128.0	20.0	30.0
1,1,2,2-Tetrachloroethane		92.9	79.8	126.3	19.0	30.0
1,2,3-Trichloropropane		90.4	78.3	138.8	21.2	30.0
n-Propylbenzene		86.9	82.0	130.7	22.4	30.0
Bromobenzene		92.6	78.7	124.6	20.7	30.0
1,3,5-Trimethylbenzene		87.8	81.3	128.9	21.1	30.0
tert-Butylbenzene		84.3	80.7	128.9	23.8	30.0
1,2,4-Trimethylbenzene		88.4	81.4	130.8	21.1	30.0
sec-Butylbenzene		87.5	77.4	129.8	23.6	30.0
p-Isopropyltoluene		88.6	79.8	137.5	24.1	30.0
1,3-Dichlorobenzene		91.3	77.0	131.3	21.4	30.0
1,4-Dichlorobenzene		93.0	20.7	137.7	21.5	30.0
1,2-Dichlorobenzene		92.7	10.0	166.2	20.5	30.0
1,2,3-Trimethylbenzene		92.7	76.3	124.2	20.1	30.0
n-Butylbenzene		91.8	80.0	133.3	22.4	30.0
Hexachloroethane		87.1	23.8	138.1	24.0	30.0
1,2-Dibromo-3-chloropropane		91.2	21.2	189.4	20.0	30.0
1,2,4-Trichlorobenzene		96.1	27.4	143.4	23.6	30.0
1,2,3-Trichlorobenzene		98.6	75.4	131.4	23.3	30.0
Naphthalene		92.9	32.9	135.8	22.4	30.0
2-Methylnaphthalene		97.6	25.5	165.5	26.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230220A7.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230220A7, Run Date: 02/20/2023 23:27, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether	*	127.4	67.4	121.2
Acetone		128.1	29.9	161.5
Methyl iodide		98.6	68.8	116.4
Carbon disulfide		88.5	63.8	137.4
tert-Methyl butyl ether (MTBE)		110.5	73.2	122.4
Acrylonitrile		124.8	69.9	128.9
2-Butanone (MEK)	*	136.0	44.0	134.4
Dichlorodifluoromethane		85.4	10.0	222.8
Chloromethane		108.9	23.8	166.5
Vinyl chloride		98.6	43.5	149.1
Bromomethane		107.7	56.8	151.3
Chloroethane		108.6	53.4	149.4
Trichlorofluoromethane		94.5	59.7	151.8
1,1-Dichloroethene		105.4	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230220A7.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230220A7, Run Date: 02/20/2023 23:27, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		103.1	73.3	121.1
trans-1,2-Dichloroethene		95.8	73.6	129.3
1,1-Dichloroethane		100.6	71.5	126.2
cis-1,2-Dichloroethene		100.0	76.6	122.1
Tetrahydrofuran		116.4	59.0	117.9
Chloroform		100.2	78.4	124.0
Bromochloromethane		102.5	78.2	120.8
1,1,1-Trichloroethane		91.0	79.4	130.9
4-Methyl-2-pentanone (MIBK)		109.6	71.6	125.2
2-Hexanone		111.6	55.4	136.9
Carbon tetrachloride		83.8	72.6	133.0
Benzene		92.9	79.9	124.9
1,2-Dichloroethane		95.7	76.0	126.3
Trichloroethene		91.0	79.7	124.2
1,2-Dichloropropane		95.3	78.6	126.4
Bromodichloromethane		93.9	80.4	128.2
Dibromomethane		99.3	76.9	122.1
cis-1,3-Dichloropropene		94.5	79.8	129.9
Toluene		93.7	79.8	124.5
trans-1,3-Dichloropropene		93.1	74.0	131.3
1,1,2-Trichloroethane		98.8	78.7	123.1
Tetrachloroethene		92.2	74.5	124.5
trans-1,4-Dichloro-2-butene		82.2	68.6	135.4
Dibromochloromethane		91.0	74.6	127.2
1,2-Dibromoethane		96.3	70.3	133.7
Chlorobenzene		91.2	79.2	122.7
1,1,1,2-Tetrachloroethane		90.2	80.3	128.2
Ethylbenzene		93.3	79.5	129.1
p,m-Xylene		90.7	79.4	132.2
o-Xylene		92.4	80.2	131.0
Styrene		91.5	69.5	126.7
Isopropylbenzene		92.7	74.4	121.5
Bromoform		91.3	69.4	128.0
1,1,2,2-Tetrachloroethane		101.3	79.8	126.3
1,2,3-Trichloropropane		98.7	78.3	138.8
n-Propylbenzene		93.1	82.0	130.7
Bromobenzene		94.6	78.7	124.6
1,3,5-Trimethylbenzene		92.4	81.3	128.9
tert-Butylbenzene		90.7	80.7	128.9
1,2,4-Trimethylbenzene		93.1	81.4	130.8
sec-Butylbenzene		94.2	77.4	129.8
p-Isopropyltoluene		95.3	79.8	137.5
1,3-Dichlorobenzene		94.3	77.0	131.3
1,4-Dichlorobenzene		95.6	20.7	137.7
1,2-Dichlorobenzene		94.9	10.0	166.2
1,2,3-Trimethylbenzene		94.9	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230220A7.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230220A7, Run Date: 02/20/2023 23:27, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		96.0	80.0	133.3
Hexachloroethane		86.3	23.8	138.1
1,2-Dibromo-3-chloropropane		103.2	21.2	189.4
1,2,4-Trichlorobenzene		99.6	27.4	143.4
1,2,3-Trichlorobenzene		97.2	75.4	131.4
Naphthalene		99.9	32.9	135.8
2-Methylnaphthalene		97.6	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230220A7.4549110N, Parent Sample ID: 230220A7.4549109M

Run in Batch: 230220A7, Run Date: 02/20/2023 23:50, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		116.2	67.4	121.2	9.2	30.0
Acetone		110.8	29.9	161.5	14.4	30.0
Methyl iodide		91.3	68.8	116.4	7.6	30.0
Carbon disulfide		84.9	63.8	137.4	4.2	30.0
tert-Methyl butyl ether (MTBE)		98.1	73.2	122.4	11.8	30.0
Acrylonitrile		105.6	69.9	128.9	16.6	30.0
2-Butanone (MEK)		107.2	44.0	134.4	23.7	30.0
Dichlorodifluoromethane		72.3	10.0	222.8	16.7	30.0
Chloromethane		96.3	23.8	166.5	12.3	30.0
Vinyl chloride		91.5	43.5	149.1	7.5	30.0
Bromomethane		100.5	56.8	151.3	6.9	30.0
Chloroethane		103.2	53.4	149.4	5.1	30.0
Trichlorofluoromethane		86.9	59.7	151.8	8.4	30.0
1,1-Dichloroethene		88.8	69.6	139.4	17.2	30.0
Methylene chloride		96.0	73.3	121.1	7.1	30.0
trans-1,2-Dichloroethene		90.1	73.6	129.3	6.2	30.0
1,1-Dichloroethane		91.4	71.5	126.2	9.5	30.0
cis-1,2-Dichloroethene		91.5	76.6	122.1	8.9	30.0
Tetrahydrofuran		95.2	59.0	117.9	20.0	30.0
Chloroform		92.0	78.4	124.0	8.5	30.0
Bromochloromethane		94.7	78.2	120.8	7.9	30.0
1,1,1-Trichloroethane		85.1	79.4	130.9	6.7	30.0
4-Methyl-2-pentanone (MIBK)		98.8	71.6	125.2	10.3	30.0
2-Hexanone		104.5	55.4	136.9	6.6	30.0
Carbon tetrachloride		77.4	72.6	133.0	8.0	30.0
Benzene		88.8	79.9	124.9	4.4	30.0
1,2-Dichloroethane		90.4	76.0	126.3	5.7	30.0
Trichloroethene		84.2	79.7	124.2	7.8	30.0
1,2-Dichloropropane		92.0	78.6	126.4	3.6	30.0
Bromodichloromethane		90.1	80.4	128.2	4.0	30.0
Dibromomethane		94.4	76.9	122.1	5.1	30.0
cis-1,3-Dichloropropene		91.4	79.8	129.9	3.4	30.0
Toluene		89.0	79.8	124.5	5.2	30.0
trans-1,3-Dichloropropene		90.5	74.0	131.3	2.9	30.0

Organics - Volatiles, Prep Batch ID: VF230220W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 230220A7.4549110N, Parent Sample ID: 230220A7.4549109M

Run in Batch: 230220A7, Run Date: 02/20/2023 23:50, Prep Date: 02/20/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		95.4	78.7	123.1	3.5	30.0
Tetrachloroethene		84.0	74.5	124.5	9.3	30.0
trans-1,4-Dichloro-2-butene		80.3	68.6	135.4	2.4	30.0
Dibromochloromethane		87.3	74.6	127.2	4.1	30.0
1,2-Dibromoethane		92.6	70.3	133.7	3.8	30.0
Chlorobenzene		88.8	79.2	122.7	2.7	30.0
1,1,1,2-Tetrachloroethane		87.4	80.3	128.2	3.2	30.0
Ethylbenzene		87.1	79.5	129.1	6.9	30.0
p,m-Xylene		85.7	79.4	132.2	5.6	30.0
o-Xylene		87.5	80.2	131.0	5.5	30.0
Styrene		88.9	69.5	126.7	2.8	30.0
Isopropylbenzene		85.6	74.4	121.5	8.0	30.0
Bromoform		88.9	69.4	128.0	2.7	30.0
1,1,2,2-Tetrachloroethane		97.1	79.8	126.3	4.3	30.0
1,2,3-Trichloropropane		96.5	78.3	138.8	2.2	30.0
n-Propylbenzene		85.2	82.0	130.7	8.8	30.0
Bromobenzene		91.4	78.7	124.6	3.4	30.0
1,3,5-Trimethylbenzene		86.4	81.3	128.9	6.7	30.0
tert-Butylbenzene		84.0	80.7	128.9	7.7	30.0
1,2,4-Trimethylbenzene		87.6	81.4	130.8	6.1	30.0
sec-Butylbenzene		85.9	77.4	129.8	9.3	30.0
p-Isopropyltoluene		85.9	79.8	137.5	10.3	30.0
1,3-Dichlorobenzene		89.3	77.0	131.3	5.4	30.0
1,4-Dichlorobenzene		90.0	20.7	137.7	6.0	30.0
1,2-Dichlorobenzene		90.8	10.0	166.2	4.4	30.0
1,2,3-Trimethylbenzene		90.0	76.3	124.2	5.3	30.0
n-Butylbenzene		87.2	80.0	133.3	9.6	30.0
Hexachloroethane		81.8	23.8	138.1	5.4	30.0
1,2-Dibromo-3-chloropropane		97.1	21.2	189.4	6.1	30.0
1,2,4-Trichlorobenzene		94.9	27.4	143.4	4.8	30.0
1,2,3-Trichlorobenzene		97.6	75.4	131.4	0.5	30.0
Naphthalene		98.3	32.9	135.8	1.7	30.0
2-Methylnaphthalene		99.7	25.5	165.5	2.1	30.0

Organics - Volatiles, Prep Batch ID: VF230223W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223C7.BLKW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 05:58, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230223W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230223C7.BLKW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 05:58, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:24, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		117.0	67.4	121.2
Acetone		117.6	29.9	161.5
Methyl iodide		99.6	68.8	116.4
Carbon disulfide		98.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.8	73.2	122.4
Acrylonitrile		106.1	69.9	128.9
2-Butanone (MEK)		107.9	44.0	134.4
Dichlorodifluoromethane		97.8	10.0	222.8
Chloromethane		121.2	23.8	166.5
Vinyl chloride		118.6	43.5	149.1
Bromomethane		121.9	56.8	151.3
Chloroethane		124.4	53.4	149.4
Trichlorofluoromethane		108.3	59.7	151.8
1,1-Dichloroethene		102.6	69.6	139.4
Methylene chloride		99.9	73.3	121.1
trans-1,2-Dichloroethene		100.9	73.6	129.3
1,1-Dichloroethane		101.1	71.5	126.2
cis-1,2-Dichloroethene		99.1	76.6	122.1
Tetrahydrofuran		97.0	59.0	117.9
Chloroform		98.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230223W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:24, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		97.0	78.2	120.8
1,1,1-Trichloroethane		95.3	79.4	130.9
4-Methyl-2-pentanone (MIBK)		103.0	71.6	125.2
2-Hexanone		106.2	55.4	136.9
Carbon tetrachloride		93.2	72.6	133.0
Benzene		100.2	79.9	124.9
1,2-Dichloroethane		98.0	76.0	126.3
Trichloroethene		97.6	79.7	124.2
1,2-Dichloropropane		101.5	78.6	126.4
Bromodichloromethane		97.9	80.4	128.2
Dibromomethane		98.4	76.9	122.1
cis-1,3-Dichloropropene		98.9	79.8	129.9
Toluene		101.1	79.8	124.5
trans-1,3-Dichloropropene		97.6	74.0	131.3
1,1,2-Trichloroethane		100.6	78.7	123.1
Tetrachloroethene		98.9	74.5	124.5
trans-1,4-Dichloro-2-butene		89.2	68.6	135.4
Dibromochloromethane		91.1	74.6	127.2
1,2-Dibromoethane		95.7	70.3	133.7
Chlorobenzene		96.4	79.2	122.7
1,1,1,2-Tetrachloroethane		92.5	80.3	128.2
Ethylbenzene		99.2	79.5	129.1
p,m-Xylene		96.9	79.4	132.2
o-Xylene		95.6	80.2	131.0
Styrene		97.2	69.5	126.7
Isopropylbenzene		97.7	74.4	121.5
Bromoform		91.3	69.4	128.0
1,1,2,2-Tetrachloroethane		99.6	79.8	126.3
1,2,3-Trichloropropane		96.9	78.3	138.8
n-Propylbenzene		98.0	82.0	130.7
Bromobenzene		97.8	78.7	124.6
1,3,5-Trimethylbenzene		95.9	81.3	128.9
tert-Butylbenzene		95.2	80.7	128.9
1,2,4-Trimethylbenzene		96.6	81.4	130.8
sec-Butylbenzene		100.1	77.4	129.8
p-Isopropyltoluene		99.8	79.8	137.5
1,3-Dichlorobenzene		98.0	77.0	131.3
1,4-Dichlorobenzene		98.6	20.7	137.7
1,2-Dichlorobenzene		98.1	10.0	166.2
1,2,3-Trimethylbenzene		100.8	76.3	124.2
n-Butylbenzene		102.0	80.0	133.3
Hexachloroethane		95.1	23.8	138.1
1,2-Dibromo-3-chloropropane		98.8	21.2	189.4
1,2,4-Trichlorobenzene		102.2	27.4	143.4
1,2,3-Trichlorobenzene		105.0	75.4	131.4
Naphthalene		101.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230223W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:24, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		107.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223C7.LCSDW23C, Parent Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:48, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		96.0	67.4	121.2	19.7	30.0
Acetone		101.9	29.9	161.5	14.3	30.0
Methyl iodide		97.8	68.8	116.4	1.8	30.0
Carbon disulfide		95.7	63.8	137.4	2.3	30.0
tert-Methyl butyl ether (MTBE)		99.5	73.2	122.4	1.3	30.0
Acrylonitrile		97.4	69.9	128.9	8.6	30.0
2-Butanone (MEK)		94.3	44.0	134.4	13.4	30.0
Dichlorodifluoromethane		96.8	10.0	222.8	1.0	30.0
Chloromethane		123.9	23.8	166.5	2.2	30.0
Vinyl chloride		120.3	43.5	149.1	1.5	30.0
Bromomethane		124.8	56.8	151.3	2.4	30.0
Chloroethane		127.9	53.4	149.4	2.8	30.0
Trichlorofluoromethane		109.0	59.7	151.8	0.6	30.0
1,1-Dichloroethene		100.0	69.6	139.4	2.5	30.0
Methylene chloride		100.6	73.3	121.1	0.6	30.0
trans-1,2-Dichloroethene		98.6	73.6	129.3	2.3	30.0
1,1-Dichloroethane		99.5	71.5	126.2	1.6	30.0
cis-1,2-Dichloroethene		99.7	76.6	122.1	0.6	30.0
Tetrahydrofuran		84.3	59.0	117.9	14.0	30.0
Chloroform		100.5	78.4	124.0	1.8	30.0
Bromochloromethane		99.1	78.2	120.8	2.2	30.0
1,1,1-Trichloroethane		95.5	79.4	130.9	0.2	30.0
4-Methyl-2-pentanone (MIBK)		93.7	71.6	125.2	9.5	30.0
2-Hexanone		91.7	55.4	136.9	14.6	30.0
Carbon tetrachloride		90.5	72.6	133.0	2.9	30.0
Benzene		99.2	79.9	124.9	1.0	30.0
1,2-Dichloroethane		98.9	76.0	126.3	0.9	30.0
Trichloroethene		97.6	79.7	124.2	0.1	30.0
1,2-Dichloropropane		101.8	78.6	126.4	0.3	30.0
Bromodichloromethane		99.9	80.4	128.2	2.0	30.0
Dibromomethane		100.3	76.9	122.1	2.0	30.0
cis-1,3-Dichloropropene		101.2	79.8	129.9	2.3	30.0
Toluene		100.2	79.8	124.5	0.9	30.0
trans-1,3-Dichloropropene		98.9	74.0	131.3	1.3	30.0
1,1,2-Trichloroethane		101.1	78.7	123.1	0.5	30.0
Tetrachloroethene		98.7	74.5	124.5	0.2	30.0
trans-1,4-Dichloro-2-butene		83.0	68.6	135.4	7.1	30.0
Dibromochloromethane		92.5	74.6	127.2	1.6	30.0
1,2-Dibromoethane		94.5	70.3	133.7	1.2	30.0
Chlorobenzene		96.3	79.2	122.7	0.1	30.0

Organics - Volatiles, Prep Batch ID: VF230223W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230223C7.LCSDW23C, Parent Sample ID: 230223C7.LCSW23C

Run in Batch: 230223C7, Run Date: 02/24/2023 04:48, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		95.6	80.3	128.2	3.3	30.0
Ethylbenzene		96.6	79.5	129.1	2.6	30.0
p,m-Xylene		95.4	79.4	132.2	1.6	30.0
o-Xylene		97.7	80.2	131.0	2.2	30.0
Styrene		98.2	69.5	126.7	1.0	30.0
Isopropylbenzene		96.6	74.4	121.5	1.2	30.0
Bromoform		89.6	69.4	128.0	1.9	30.0
1,1,2,2-Tetrachloroethane		92.7	79.8	126.3	7.2	30.0
1,2,3-Trichloropropane		90.8	78.3	138.8	6.5	30.0
n-Propylbenzene		97.1	82.0	130.7	0.9	30.0
Bromobenzene		98.3	78.7	124.6	0.5	30.0
1,3,5-Trimethylbenzene		96.9	81.3	128.9	1.1	30.0
tert-Butylbenzene		95.5	80.7	128.9	0.3	30.0
1,2,4-Trimethylbenzene		96.3	81.4	130.8	0.2	30.0
sec-Butylbenzene		100.2	77.4	129.8	0.0	30.0
p-Isopropyltoluene		99.7	79.8	137.5	0.1	30.0
1,3-Dichlorobenzene		98.9	77.0	131.3	1.0	30.0
1,4-Dichlorobenzene		100.5	20.7	137.7	1.9	30.0
1,2-Dichlorobenzene		99.9	10.0	166.2	1.9	30.0
1,2,3-Trimethylbenzene		100.9	76.3	124.2	0.1	30.0
n-Butylbenzene		100.9	80.0	133.3	1.1	30.0
Hexachloroethane		93.6	23.8	138.1	1.6	30.0
1,2-Dibromo-3-chloropropane		87.3	21.2	189.4	12.4	30.0
1,2,4-Trichlorobenzene		103.5	27.4	143.4	1.2	30.0
1,2,3-Trichlorobenzene		104.6	75.4	131.4	0.4	30.0
Naphthalene		95.2	32.9	135.8	6.6	30.0
2-Methylnaphthalene		102.2	25.5	165.5	4.6	30.0

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		92.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		90.3	70.0	130.0	2.6	30.0

Organics - Volatiles, Prep Batch ID: VS230224W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230224A9.BLKW24A

Run in Batch: 230224A9, Run Date: 02/24/2023 16:38, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:12, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		95.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230224A9.LCSD24A, Parent Sample ID: 230224A9.LCSS24A

Run in Batch: 230224A9, Run Date: 02/24/2023 14:33, Prep Date: 02/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		88.0	70.0	130.0	7.9	30.0

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		89.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.7	70.0	130.0	7.4	30.0

Organics - Volatiles, Prep Batch ID: VS230228W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		85.6	70.0	130.0	1.9	30.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.7	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.0	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		110.1	70.0	130.0	24.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.1	70.0	130.0	0.7	30.0

Merit Laboratories Login Checklist

Lab Set ID: S45491
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30112892 / RACER Lansing
Submitted: 02/17/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF _____ 152333

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: Kaitlin Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: 947-777-5215 P.O. NO.:
E-MAIL ADDRESS: Kaitlin.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30112892 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIMS	VOCs 8260B SIMS	SVOCs 8270 SIMS	Special Instructions
45491.01	2/15/23	1015	MW-22-156_021523	GW	3		3						X	X		
.02	2/15/23	1110	MW-22-153_021523	GW	3		3						X	X		
.03	2/15/23	1220	MW-22-155_021523	GW	3		3						X	X		
.04	2/15/23	1325	MW-14-58R_021523	GW	3		3						X	X		
.05	2/15/23	—	DUP-01_021523	GW	3		3						X	X		
.06	2/15/23	1430	MW-22-157_021523	GW	3		3						X			
.07	2/15/23	1555	MW-21-139_021523	GW	3		3						X			
.08/.09/.10	2/16/23	0920	MW-21-140_021623	GW	15	6	9						X	X	X	MS/MSD
.11	2/16/23	1120	MW-16-78_021623	GW	5	2	3						X	X	X	
.12	2/16/23	—	DUP-02_021623	GW	5	2	3						X	X	X	
.13	2/15/23	—	Trip Blank	GW	1		1							X		
.14	2/16/23	1255	MW-19-123_021623	GW	3		3						X			

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 2/17/23 TIME 1530
RECEIVED BY: SIGNATURE/ORGANIZATION	Johanna Murray	DATE 2/17/23 TIME 1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE TIME

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S45492.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S45492.01-S45492.04
Project: 30112892.0470A
Collected Date(s): 02/16/2023
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Donald Richmond
P.O. #: 30112892.0470A

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S45492.01	MW-20-126_021623	Groundwater	02/16/23 11:20
S45492.02	TW-15-12_021623	Groundwater	02/16/23 13:05
S45492.03	PW-14-02_021623	Groundwater	02/16/23 14:10
S45492.04	MW-20-127_021623	Groundwater	02/16/23 15:40

Analytical Laboratory Report

Lab Sample ID: S45492.01
Sample Tag: MW-20-126_021623
Collected Date/Time: 02/16/2023 11:20
Matrix: Groundwater
COC Reference: 152334

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 14:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	82	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45492.02
Sample Tag: TW-15-12_021623
Collected Date/Time: 02/16/2023 13:05
Matrix: Groundwater
COC Reference: 152334

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 19:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Lab Sample ID: S45492.03
Sample Tag: PW-14-02_021623
Collected Date/Time: 02/16/2023 14:10
Matrix: Groundwater
COC Reference: 152334

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 15:44, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	18	1		ug/L	1	123-91-1	

Lab Sample ID: S45492.04
Sample Tag: MW-20-127_021623
Collected Date/Time: 02/16/2023 15:40
Matrix: Groundwater
COC Reference: 152334

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 16:05, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	146	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S45492.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S45492.01-S45492.04
Project: 30112892.0470A
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Donald Richmond
P.O. #: 30112892.0470A

QC Report Sections

Cover Page (Page 10)
Analysis Summary (Pages 11-14)
Prep Batch Summary (Page 15)
Surrogates per QC Sample (Pages 16-17)
Internal Standards per Lab Sample (Pages 18-21)
Internal Standards per QC Sample (Pages 22-23)
Batch QC Results (Pages 24-25)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S45492.01
Sample Tag: MW-20-126_021623
Collected Date/Time: 02/16/2023 11:20
Matrix: Groundwater
COC Reference: 152334

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 14:59	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45492.02
Sample Tag: TW-15-12_021623
Collected Date/Time: 02/16/2023 13:05
Matrix: Groundwater
COC Reference: 152334

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 19:35	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45492.03
Sample Tag: PW-14-02_021623
Collected Date/Time: 02/16/2023 14:10
Matrix: Groundwater
COC Reference: 152334

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 15:44	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45492.04
Sample Tag: MW-20-127_021623
Collected Date/Time: 02/16/2023 15:40
Matrix: Groundwater
COC Reference: 152334

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 16:05	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45492.01	1,4-Dioxane	SW8260B - SIM	02/23/23 14:59	230223A9
S45492.03	1,4-Dioxane	SW8260B - SIM	02/23/23 15:44	230223A9
S45492.04	1,4-Dioxane	SW8260B - SIM	02/23/23 16:05	230223A9

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45492.02	1,4-Dioxane	SW8260B - SIM	02/27/23 19:35	230227A9

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45492.01

Sample Tag: MW-20-126_021623

Collected Date/Time: 02/16/2023 11:20

Matrix: Groundwater

COC Reference: 152334

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 14:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**110.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45492.02

Sample Tag: TW-15-12_021623

Collected Date/Time: 02/16/2023 13:05

Matrix: Groundwater

COC Reference: 152334

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 19:35, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45492.03

Sample Tag: PW-14-02_021623

Collected Date/Time: 02/16/2023 14:10

Matrix: Groundwater

COC Reference: 152334

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 15:44, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**109.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45492.04

Sample Tag: MW-20-127_021623

Collected Date/Time: 02/16/2023 15:40

Matrix: Groundwater

COC Reference: 152334

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 16:05, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**113.0**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**76.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**89.9**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		92.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		90.3	70.0	130.0	2.6	30.0

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		89.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.7	70.0	130.0	7.4	30.0

Merit Laboratories Login Checklist

Lab Set ID: S45492
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30112892.0470A
Submitted: 02/17/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152334

CHAIN OF CUSTODY RECORD

Plant 2

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: CELL NO.: 2488094013/9477775215
P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30112892.0470A
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG, IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane
45492.01	2/16/23	1120	MW-20-126_021623	GW	3		X						X
.02	2/16/23	1305	TW-15-12_021623	GW	3		X						X
.03	2/16/23	1410	PW-14-02_021623	G	3		X						X
.04	2/16/23	1540	MW-20-127_021623	G	3		X						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Donald Richmond / Arcadis ☑ Sampler DATE: 2/17/23 TIME: 1530
RECEIVED BY: SIGNATURE/ORGANIZATION: Jotheanna Murray DATE: 2/17/23 TIME: 1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S45493.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S45493.01-S45493.04
Project: RACER Lansing
Collected Date(s): 02/16/2023
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Billy Cobern
P.O. #: 30112892

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S45493.01	MW-19-121_021623	Groundwater	02/16/23 09:35
S45493.02	MW-19-122_021623	Groundwater	02/16/23 11:05
S45493.03	MW-20-129_021623	Groundwater	02/16/23 12:10
S45493.04	TW-14-02_021623	Groundwater	02/16/23 13:35

Analytical Laboratory Report

Lab Sample ID: S45493.01
Sample Tag: MW-19-121_021623
Collected Date/Time: 02/16/2023 09:35
Matrix: Groundwater
COC Reference: 152331

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 19:57, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45493.02
Sample Tag: MW-19-122_021623
Collected Date/Time: 02/16/2023 11:05
Matrix: Groundwater
COC Reference: 152331

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 16:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S45493.03
Sample Tag: MW-20-129_021623
Collected Date/Time: 02/16/2023 12:10
Matrix: Groundwater
COC Reference: 152331

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 17:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	71	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45493.04
Sample Tag: TW-14-02_021623
Collected Date/Time: 02/16/2023 13:35
Matrix: Groundwater
COC Reference: 152331

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 20:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S45493.01(01)+QC01
Generated on 02/28/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S45493.01-S45493.04
Project: RACER Lansing
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Billy Cobern
P.O. #: 30112892

QC Report Sections

Cover Page (Page 10)
Analysis Summary (Pages 11-14)
Prep Batch Summary (Page 15)
Surrogates per QC Sample (Pages 16-17)
Internal Standards per Lab Sample (Pages 18-21)
Internal Standards per QC Sample (Pages 22-23)
Batch QC Results (Pages 24-25)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S45493.01
Sample Tag: MW-19-121_021623
Collected Date/Time: 02/16/2023 09:35
Matrix: Groundwater
COC Reference: 152331

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 19:57	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45493.02
Sample Tag: MW-19-122_021623
Collected Date/Time: 02/16/2023 11:05
Matrix: Groundwater
COC Reference: 152331

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 16:49	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45493.03
Sample Tag: MW-20-129_021623
Collected Date/Time: 02/16/2023 12:10
Matrix: Groundwater
COC Reference: 152331

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 17:11	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45493.04
Sample Tag: TW-14-02_021623
Collected Date/Time: 02/16/2023 13:35
Matrix: Groundwater
COC Reference: 152331

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 20:19	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45493.02	1,4-Dioxane	SW8260B - SIM	02/23/23 16:49	230223A9
S45493.03	1,4-Dioxane	SW8260B - SIM	02/23/23 17:11	230223A9

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45493.01	1,4-Dioxane	SW8260B - SIM	02/27/23 19:57	230227A9
S45493.04	1,4-Dioxane	SW8260B - SIM	02/27/23 20:19	230227A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45493.01

Sample Tag: MW-19-121_021623

Collected Date/Time: 02/16/2023 09:35

Matrix: Groundwater

COC Reference: 152331

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 19:57, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45493.02

Sample Tag: MW-19-122_021623

Collected Date/Time: 02/16/2023 11:05

Matrix: Groundwater

COC Reference: 152331

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 16:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45493.03

Sample Tag: MW-20-129_021623

Collected Date/Time: 02/16/2023 12:10

Matrix: Groundwater

COC Reference: 152331

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 17:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45493.04

Sample Tag: TW-14-02_021623

Collected Date/Time: 02/16/2023 13:35

Matrix: Groundwater

COC Reference: 152331

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 20:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.4**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.6**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**76.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**88.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**89.9**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		92.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		90.3	70.0	130.0	2.6	30.0

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		89.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.7	70.0	130.0	7.4	30.0

Merit Laboratories Login Checklist

Lab Set ID: S45493
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing
Submitted: 02/17/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152331

CHAIN OF CUSTODY RECORD

PLANT-2

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 CELL NO.: 947-777-5215 P.O. NO.: 30112892
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Cobern

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260-B SIMS
45493.01	2/16/23	0935	MW-19-121_021623	GW	3		3						X
.02	2/16/23	1105	MW-19-122_021623	GW	3		3						X
.03	2/16/23	12:10	MW-20-129_021623	GW	3		3						X
.04	2/16/23	13:35	TW-14-02_021623	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: ARCADIS ☒ Sampler DATE: 2/17/23 TIME: 1530
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 2/17/23 TIME: 1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S45494.01(01)+QC01
Generated on 03/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S45494.01-S45494.10
Project: 30171056 / RACER Lansing
Collected Date(s): 02/17/2023
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Donald Richmond
P.O. #: 30171056

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S45494.01	MW-13-34_021723	Groundwater	02/17/23 10:30
S45494.02	TW-15-11_021723	Groundwater	02/17/23 12:30
S45494.03	TW-15-11_021723 MS	Groundwater	02/17/23 12:30
S45494.04	TW-15-11_021723 MSD	Groundwater	02/17/23 12:30
S45494.05	MW-12-21_021723	Groundwater	02/17/23 13:45
S45494.06	PW-14-03_021723	Groundwater	02/17/23 09:20
S45494.07	AS-19-A07_021723	Groundwater	02/17/23 11:00
S45494.08	AS-19-A06_021723	Groundwater	02/17/23 12:10
S45494.09	MW-13-22_021723	Groundwater	02/17/23 13:40
S45494.10	DUP-04_021723	Groundwater	02/17/23 00:01

Analytical Laboratory Report

Lab Sample ID: S45494.01
Sample Tag: MW-13-34_021723
Collected Date/Time: 02/17/2023 10:30
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 17:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	85	1		ug/L	1	123-91-1	

Lab Sample ID: S45494.02
Sample Tag: TW-15-11_021723
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 15:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	17	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45494.03
Sample Tag: TW-15-11_021723 MS
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 18:15	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 13:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	67	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S45494.04
Sample Tag: TW-15-11_021723 MSD
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 18:15	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 13:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	67	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S45494.05
Sample Tag: MW-12-21_021723
Collected Date/Time: 02/17/2023 13:45
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 18:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	141	1		ug/L	1	123-91-1	

Lab Sample ID: S45494.06
Sample Tag: PW-14-03_021723
Collected Date/Time: 02/17/2023 09:20
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 21:03, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S45494.07
Sample Tag: AS-19-A07_021723
Collected Date/Time: 02/17/2023 11:00
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 21:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45494.08
Sample Tag: AS-19-A06_021723
Collected Date/Time: 02/17/2023 12:10
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/27/23 21:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S45494.09
Sample Tag: MW-13-22_021723
Collected Date/Time: 02/17/2023 13:40
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/24/23 15:24	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/23/23 20:05, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	171	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S45494.10
Sample Tag: DUP-04_021723
Collected Date/Time: 02/17/2023 00:01
Matrix: Groundwater
COC Reference: 152799

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/28/23 12:00	ASW	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 02/28/23 15:58, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	87	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S45494.01(01)+QC01
Generated on 03/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S45494.01-S45494.10
Project: 30171056 / RACER Lansing
Submitted Date/Time: 02/17/2023 15:30
Sampled by: Donald Richmond
P.O. #: 30171056

QC Report Sections

Cover Page (Page 16)
Analysis Summary (Pages 17-26)
Prep Batch Summary (Page 27)
Surrogates per QC Sample (Pages 28-30)
Internal Standards per Lab Sample (Pages 31-38)
Internal Standards per QC Sample (Pages 39-41)
Batch QC Results (Pages 42-44)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.



Barbara Ball
Quality Assurance Manager

Lab Sample ID: S45494.01
Sample Tag: MW-13-34_021723
Collected Date/Time: 02/17/2023 10:30
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 17:55	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.02
Sample Tag: TW-15-11_021723
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 15:36	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45494.03
Sample Tag: TW-15-11_021723 MS
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 13:29	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45494.04
Sample Tag: TW-15-11_021723 MSD
Collected Date/Time: 02/17/2023 12:30
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 13:49	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S45494.05
Sample Tag: MW-12-21_021723
Collected Date/Time: 02/17/2023 13:45
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 18:38	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.06
Sample Tag: PW-14-03_021723
Collected Date/Time: 02/17/2023 09:20
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 21:03	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.07
Sample Tag: AS-19-A07_021723
Collected Date/Time: 02/17/2023 11:00
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 21:26	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.08
Sample Tag: AS-19-A06_021723
Collected Date/Time: 02/17/2023 12:10
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/27/23 21:48	230227A9	VS230227W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.09
Sample Tag: MW-13-22_021723
Collected Date/Time: 02/17/2023 13:40
Matrix: Groundwater
COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/23/23 20:05	230223A9	VS230223W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S45494.10

Sample Tag: DUP-04_021723

Collected Date/Time: 02/17/2023 00:01

Matrix: Groundwater

COC Reference: 152799

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	02/28/23 15:58	230228A9	VS230228W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45494.01	1,4-Dioxane	SW8260B - SIM	02/23/23 17:55	230223A9
S45494.05	1,4-Dioxane	SW8260B - SIM	02/23/23 18:38	230223A9
S45494.09	1,4-Dioxane	SW8260B - SIM	02/23/23 20:05	230223A9

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45494.06	1,4-Dioxane	SW8260B - SIM	02/27/23 21:03	230227A9
S45494.07	1,4-Dioxane	SW8260B - SIM	02/27/23 21:26	230227A9
S45494.08	1,4-Dioxane	SW8260B - SIM	02/27/23 21:48	230227A9

Organics - Volatiles, Prep Batch ID: VS230228W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S45494.02	1,4-Dioxane	SW8260B - SIM	02/28/23 15:36	230228A9
S45494.03	1,4-Dioxane	SW8260B - SIM	02/28/23 13:29	230228A9
S45494.04	1,4-Dioxane	SW8260B - SIM	02/28/23 13:49	230228A9
S45494.10	1,4-Dioxane	SW8260B - SIM	02/28/23 15:58	230228A9

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Organics - Volatiles, Prep Batch ID: VS230228W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.01

Sample Tag: MW-13-34_021723

Collected Date/Time: 02/17/2023 10:30

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 17:55, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**112.1**	50.0	200.0

Lab Sample ID: S45494.02

Sample Tag: TW-15-11_021723

Collected Date/Time: 02/17/2023 12:30

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230228A9, Run Date: 02/28/2023 15:36, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.05

Sample Tag: MW-12-21_021723

Collected Date/Time: 02/17/2023 13:45

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 18:38, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.06

Sample Tag: PW-14-03_021723

Collected Date/Time: 02/17/2023 09:20

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 21:03, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.07

Sample Tag: AS-19-A07_021723

Collected Date/Time: 02/17/2023 11:00

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 21:26, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.08

Sample Tag: AS-19-A06_021723

Collected Date/Time: 02/17/2023 12:10

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230227A9, Run Date: 02/27/2023 21:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**86.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S45494.09

Sample Tag: MW-13-22_021723

Collected Date/Time: 02/17/2023 13:40

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230223A9, Run Date: 02/23/2023 20:05, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.4**	50.0	200.0

Lab Sample ID: S45494.10

Sample Tag: DUP-04_021723

Collected Date/Time: 02/17/2023 00:01

Matrix: Groundwater

COC Reference: 152799

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230228A9, Run Date: 02/28/2023 15:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**82.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230223W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**106.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230227W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**76.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**89.9**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230228W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**71.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**86.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**77.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**71.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**68.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**78.9**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230223W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230223A9.BLKW23A

Run in Batch: 230223A9, Run Date: 02/23/2023 13:54, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:30, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		92.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230223A9.LCSDS23A, Parent Sample ID: 230223A9.LCSS23A

Run in Batch: 230223A9, Run Date: 02/23/2023 12:51, Prep Date: 02/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		90.3	70.0	130.0	2.6	30.0

Organics - Volatiles, Prep Batch ID: VS230227W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230227A9.BLKW27A

Run in Batch: 230227A9, Run Date: 02/27/2023 16:44, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:18, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		89.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230227A9.LCSDS27A, Parent Sample ID: 230227A9.LCSS27A

Run in Batch: 230227A9, Run Date: 02/27/2023 14:39, Prep Date: 02/27/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.7	70.0	130.0	7.4	30.0

Organics - Volatiles, Prep Batch ID: VS230228W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230228A9.BLKS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 14:52, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 11:59, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230228A9.LCSDS28A, Parent Sample ID: 230228A9.LCSS28A

Run in Batch: 230228A9, Run Date: 02/28/2023 12:27, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		85.6	70.0	130.0	1.9	30.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549109M, Parent Sample ID: S45491.08

Run in Batch: 230228A9, Run Date: 02/28/2023 12:48, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.7	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230228A9.4549403M, Parent Sample ID: S45494.02

Run in Batch: 230228A9, Run Date: 02/28/2023 13:29, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.0	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549110N, Parent Sample ID: 230228A9.4549109M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:08, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		110.1	70.0	130.0	24.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230228A9.4549404N, Parent Sample ID: 230228A9.4549403M

Run in Batch: 230228A9, Run Date: 02/28/2023 13:49, Prep Date: 02/28/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.1	70.0	130.0	0.7	30.0

Merit Laboratories Login Checklist

Lab Set ID: S45494
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056 / RACER Lansing
Submitted: 02/17/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152799

CHAIN OF CUSTODY RECORD

Plant 3

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 809 4013 CELL NO.: 447 777 5215 P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056 / Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane
45494.01	2/17/23	1030	MW-13-34_021723	GW	3		X						X
.02/.03/.04	2/17/23	1230	TW-15-11_021723	GW	9		X						X
.05	2/17/23	1345	MW-12-21_021723	GW	3		X						X
.06	2/17/23	0920	PW-14-03_021723	GW	3		X						X
.07	2/17/23	1100	AS-19-A07_021723	GW	3		X						X
.08	2/17/23	1240	AS-19-A06_021723	GW	3		X						X
.09	2/17/23	1340	MW-13-22_021723	GW	3		X						X
.10	2/17/23	—	DUP-04_021723	GW	3		X						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Donald Richmond/Arcadis ☑ Sampler	DATE	TIME
		2/17/23	1530
RECEIVED BY: SIGNATURE/ORGANIZATION	Johanna Murray	DATE	TIME
		2/17/23	1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER Lansing

Project Number: 30112892.0370A

Lot Number:**YB17038**

Date Completed:03/15/2023

03/15/2023 2:35 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YB17038

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YB17038-006, YB17038-008, YB17038-011, YB17038-014 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YB17038-001, YB17038-007, YB17038-008, YB17038-009, YB17038-013, YB17038-016, YB17038-017, YB17038-019. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: YB17038-012. Re-extraction and/or re-analysis was performed with concurring results. The original analysis has been reported.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YB17038

Project Name: RACER Lansing

Project Number: 30112892.0370A

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-143_021323	Aqueous	02/13/2023 1305	02/17/2023
002	MW-22-144_021323	Aqueous	02/13/2023 1410	02/17/2023
003	MW-22-145_021323	Aqueous	02/13/2023 1450	02/17/2023
004	MW-22-146_021323	Aqueous	02/13/2023 1540	02/17/2023
005	DUP-07_021323	Aqueous	02/13/2023	02/17/2023
006	MW-22-158_021323	Aqueous	02/13/2023 1640	02/17/2023
007	MW-22-152_021323	Aqueous	02/13/2023 1355	02/17/2023
008	MW-22-151_021323	Aqueous	02/13/2023 1505	02/17/2023
009	MW-22-150_021323	Aqueous	02/13/2023 1555	02/17/2023
010	MW-22-149_021323	Aqueous	02/13/2023 1655	02/17/2023
011	MW-22-160_021423	Aqueous	02/14/2023 1400	02/17/2023
012	MW-14-67_021423	Aqueous	02/14/2023 1510	02/17/2023
013	MW-13-36R_021423	Aqueous	02/14/2023 1605	02/17/2023
014	MW-22-148_021423	Aqueous	02/14/2023 1255	02/17/2023
015	MW-22-147_021423	Aqueous	02/14/2023 1415	02/17/2023
016	P6-SB-07_021523	Aqueous	02/15/2023 1055	02/17/2023
017	MW-12-12_021523	Aqueous	02/15/2023 1155	02/17/2023
018	MW-14-70_021523	Aqueous	02/15/2023 1315	02/17/2023
019	MW-12-13_021523	Aqueous	02/15/2023 1420	02/17/2023
020	DUP-05_021523	Aqueous	02/15/2023	02/17/2023
021	EB-01_021523	Aqueous	02/15/2023 1000	02/17/2023

(21 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YB17038

Project Name: RACER Lansing

Project Number: 30112892.0370A

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-143_021323	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	9
001	MW-22-143_021323	Aqueous	PFBA	PFAS by ID	11		ng/L	9
001	MW-22-143_021323	Aqueous	PFHpA	PFAS by ID	6.4		ng/L	9
001	MW-22-143_021323	Aqueous	PFHxA	PFAS by ID	17		ng/L	9
001	MW-22-143_021323	Aqueous	PFOA	PFAS by ID	5.5		ng/L	9
001	MW-22-143_021323	Aqueous	PFPeA	PFAS by ID	14		ng/L	9
002	MW-22-144_021323	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	11
002	MW-22-144_021323	Aqueous	PFHxS	PFAS by ID	4.5		ng/L	11
002	MW-22-144_021323	Aqueous	PFBA	PFAS by ID	3.2	J	ng/L	11
002	MW-22-144_021323	Aqueous	PFHpA	PFAS by ID	2.6	J	ng/L	11
002	MW-22-144_021323	Aqueous	PFHxA	PFAS by ID	4.4		ng/L	11
002	MW-22-144_021323	Aqueous	PFOA	PFAS by ID	5.0		ng/L	11
002	MW-22-144_021323	Aqueous	PFPeA	PFAS by ID	3.7		ng/L	11
003	MW-22-145_021323	Aqueous	PFBS	PFAS by ID	3.4	J	ng/L	13
003	MW-22-145_021323	Aqueous	PFHxS	PFAS by ID	1.7	J	ng/L	13
003	MW-22-145_021323	Aqueous	PFBA	PFAS by ID	4.9		ng/L	13
003	MW-22-145_021323	Aqueous	PFHpA	PFAS by ID	3.9		ng/L	13
003	MW-22-145_021323	Aqueous	PFHxA	PFAS by ID	5.5		ng/L	13
003	MW-22-145_021323	Aqueous	PFOA	PFAS by ID	11		ng/L	13
003	MW-22-145_021323	Aqueous	PFPeA	PFAS by ID	5.1		ng/L	13
004	MW-22-146_021323	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	15
004	MW-22-146_021323	Aqueous	PFOSA	PFAS by ID	0.55	J	ng/L	15
004	MW-22-146_021323	Aqueous	PFHxS	PFAS by ID	0.60	J	ng/L	15
004	MW-22-146_021323	Aqueous	PFBA	PFAS by ID	7.1		ng/L	15
004	MW-22-146_021323	Aqueous	PFOA	PFAS by ID	1.7	J	ng/L	15
004	MW-22-146_021323	Aqueous	PFOS	PFAS by ID	1.8	J	ng/L	15
005	DUP-07_021323	Aqueous	PFBS	PFAS by ID	2.2	J	ng/L	17
005	DUP-07_021323	Aqueous	PFHxS	PFAS by ID	0.57	J	ng/L	17
005	DUP-07_021323	Aqueous	PFBA	PFAS by ID	6.8		ng/L	17
005	DUP-07_021323	Aqueous	PFOA	PFAS by ID	1.6	J	ng/L	17
005	DUP-07_021323	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	17
006	MW-22-158_021323	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	19
006	MW-22-158_021323	Aqueous	PFBA	PFAS by ID	4.6		ng/L	19
006	MW-22-158_021323	Aqueous	PFHpA	PFAS by ID	1.5	J	ng/L	19
006	MW-22-158_021323	Aqueous	PFHxA	PFAS by ID	3.1	J	ng/L	19
006	MW-22-158_021323	Aqueous	PFPeA	PFAS by ID	3.3	J	ng/L	19
007	MW-22-152_021323	Aqueous	PFBS	PFAS by ID	11		ng/L	21
007	MW-22-152_021323	Aqueous	PFPeS	PFAS by ID	0.55	J	ng/L	21
007	MW-22-152_021323	Aqueous	PFHxS	PFAS by ID	4.9		ng/L	21
007	MW-22-152_021323	Aqueous	PFBA	PFAS by ID	6.0		ng/L	21
007	MW-22-152_021323	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	21
007	MW-22-152_021323	Aqueous	PFHxA	PFAS by ID	3.7		ng/L	21
007	MW-22-152_021323	Aqueous	PFOA	PFAS by ID	5.4		ng/L	21

Detection Summary (Continued)

Lot Number: YB17038

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
007	MW-22-152_021323	Aqueous	PFPeA	PFAS by ID	5.9		ng/L	21
007	MW-22-152_021323	Aqueous	PFOS	PFAS by ID	2.4	J	ng/L	21
008	MW-22-151_021323	Aqueous	PFBS	PFAS by ID	8.3		ng/L	23
008	MW-22-151_021323	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	23
008	MW-22-151_021323	Aqueous	PFBA	PFAS by ID	12		ng/L	23
008	MW-22-151_021323	Aqueous	PFHpA	PFAS by ID	3.6		ng/L	23
008	MW-22-151_021323	Aqueous	PFHxA	PFAS by ID	5.6		ng/L	23
008	MW-22-151_021323	Aqueous	PFOA	PFAS by ID	8.0		ng/L	23
008	MW-22-151_021323	Aqueous	PFPeA	PFAS by ID	13		ng/L	23
008	MW-22-151_021323	Aqueous	PFOS	PFAS by ID	3.7		ng/L	23
009	MW-22-150_021323	Aqueous	PFBA	PFAS by ID	2.6	J	ng/L	25
009	MW-22-150_021323	Aqueous	PFPeA	PFAS by ID	4.0		ng/L	25
010	MW-22-149_021323	Aqueous	6:2 FTS	PFAS by ID	7.7		ng/L	27
010	MW-22-149_021323	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFHpS	PFAS by ID	2.7	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFHxS	PFAS by ID	0.52	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFBA	PFAS by ID	0.52	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFNA	PFAS by ID	0.66	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFOA	PFAS by ID	1.3	J	ng/L	27
010	MW-22-149_021323	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	27
011	MW-22-160_021423	Aqueous	6:2 FTS	PFAS by ID	8.3		ng/L	29
011	MW-22-160_021423	Aqueous	PFBA	PFAS by ID	0.93	J	ng/L	29
012	MW-14-67_021423	Aqueous	6:2 FTS	PFAS by ID	8.3		ng/L	31
012	MW-14-67_021423	Aqueous	PFBS	PFAS by ID	3.5		ng/L	31
012	MW-14-67_021423	Aqueous	PFBA	PFAS by ID	49	Q	ng/L	31
012	MW-14-67_021423	Aqueous	PFDA	PFAS by ID	1.3	J	ng/L	31
012	MW-14-67_021423	Aqueous	PFHpA	PFAS by ID	30		ng/L	31
012	MW-14-67_021423	Aqueous	PFHxA	PFAS by ID	79		ng/L	31
012	MW-14-67_021423	Aqueous	PFNA	PFAS by ID	0.62	J	ng/L	31
012	MW-14-67_021423	Aqueous	PFOA	PFAS by ID	19		ng/L	31
012	MW-14-67_021423	Aqueous	PFPeA	PFAS by ID	58		ng/L	31
012	MW-14-67_021423	Aqueous	PFOS	PFAS by ID	1.8	J	ng/L	31
013	MW-13-36R_021423	Aqueous	EtFOSAA	PFAS by ID	6.3	J	ng/L	33
013	MW-13-36R_021423	Aqueous	MeFOSAA	PFAS by ID	4.3	J	ng/L	33
013	MW-13-36R_021423	Aqueous	PFBS	PFAS by ID	2.2	J	ng/L	33
013	MW-13-36R_021423	Aqueous	PFOSA	PFAS by ID	3.7		ng/L	33
013	MW-13-36R_021423	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	33
013	MW-13-36R_021423	Aqueous	PFBA	PFAS by ID	22		ng/L	33
013	MW-13-36R_021423	Aqueous	PFDA	PFAS by ID	25		ng/L	33
013	MW-13-36R_021423	Aqueous	PFDoA	PFAS by ID	0.49	J	ng/L	33
013	MW-13-36R_021423	Aqueous	PFHpA	PFAS by ID	32		ng/L	33
013	MW-13-36R_021423	Aqueous	PFHxA	PFAS by ID	35		ng/L	33
013	MW-13-36R_021423	Aqueous	PFNA	PFAS by ID	15		ng/L	33
013	MW-13-36R_021423	Aqueous	PFOA	PFAS by ID	71		ng/L	33
013	MW-13-36R_021423	Aqueous	PFPeA	PFAS by ID	30		ng/L	33
013	MW-13-36R_021423	Aqueous	PFUdA	PFAS by ID	0.80	J	ng/L	33
013	MW-13-36R_021423	Aqueous	PFOS	PFAS by ID	44		ng/L	33
014	MW-22-148_021423	Aqueous	PFBS	PFAS by ID	1.7	J	ng/L	35

Detection Summary (Continued)

Lot Number: YB17038

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
014	MW-22-148_021423	Aqueous	PFBA	PFAS by ID	0.88	J	ng/L	35
015	MW-22-147_021423	Aqueous	PFBS	PFAS by ID	2.1	J	ng/L	37
015	MW-22-147_021423	Aqueous	PFHxS	PFAS by ID	1.6	J	ng/L	37
015	MW-22-147_021423	Aqueous	PFBA	PFAS by ID	5.4		ng/L	37
015	MW-22-147_021423	Aqueous	PFHpA	PFAS by ID	0.98	J	ng/L	37
015	MW-22-147_021423	Aqueous	PFHxA	PFAS by ID	1.7	J	ng/L	37
015	MW-22-147_021423	Aqueous	PFOA	PFAS by ID	3.6		ng/L	37
015	MW-22-147_021423	Aqueous	PFPeA	PFAS by ID	2.1	J	ng/L	37
015	MW-22-147_021423	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	37
016	P6-SB-07_021523	Aqueous	PFBS	PFAS by ID	6.2		ng/L	39
016	P6-SB-07_021523	Aqueous	PFHpS	PFAS by ID	1.1	J	ng/L	39
016	P6-SB-07_021523	Aqueous	PFOSA	PFAS by ID	0.62	J	ng/L	39
016	P6-SB-07_021523	Aqueous	PFPeS	PFAS by ID	2.5	J	ng/L	39
016	P6-SB-07_021523	Aqueous	PFHxS	PFAS by ID	6.6		ng/L	39
016	P6-SB-07_021523	Aqueous	PFBA	PFAS by ID	410		ng/L	39
016	P6-SB-07_021523	Aqueous	PFDA	PFAS by ID	56		ng/L	39
016	P6-SB-07_021523	Aqueous	PFHpA	PFAS by ID	1200		ng/L	39
016	P6-SB-07_021523	Aqueous	PFHxA	PFAS by ID	1500		ng/L	39
016	P6-SB-07_021523	Aqueous	PFNA	PFAS by ID	220		ng/L	39
016	P6-SB-07_021523	Aqueous	PFOA	PFAS by ID	1600		ng/L	39
016	P6-SB-07_021523	Aqueous	PFPeA	PFAS by ID	1400		ng/L	39
016	P6-SB-07_021523	Aqueous	PFOS	PFAS by ID	110		ng/L	39
017	MW-12-12_021523	Aqueous	PFHpS	PFAS by ID	0.43	J	ng/L	41
017	MW-12-12_021523	Aqueous	PFHxS	PFAS by ID	1.8	J	ng/L	41
017	MW-12-12_021523	Aqueous	PFBA	PFAS by ID	38		ng/L	41
017	MW-12-12_021523	Aqueous	PFDA	PFAS by ID	11		ng/L	41
017	MW-12-12_021523	Aqueous	PFHpA	PFAS by ID	32		ng/L	41
017	MW-12-12_021523	Aqueous	PFHxA	PFAS by ID	97		ng/L	41
017	MW-12-12_021523	Aqueous	PFNA	PFAS by ID	5.9		ng/L	41
017	MW-12-12_021523	Aqueous	PFOA	PFAS by ID	78		ng/L	41
017	MW-12-12_021523	Aqueous	PFPeA	PFAS by ID	65		ng/L	41
017	MW-12-12_021523	Aqueous	PFOS	PFAS by ID	36		ng/L	41
018	MW-14-70_021523	Aqueous	PFBS	PFAS by ID	3.7		ng/L	43
018	MW-14-70_021523	Aqueous	PFPeS	PFAS by ID	0.59	J	ng/L	43
018	MW-14-70_021523	Aqueous	PFBA	PFAS by ID	100		ng/L	43
018	MW-14-70_021523	Aqueous	PFHpA	PFAS by ID	110		ng/L	43
018	MW-14-70_021523	Aqueous	PFHxA	PFAS by ID	310		ng/L	43
018	MW-14-70_021523	Aqueous	PFOA	PFAS by ID	17		ng/L	43
018	MW-14-70_021523	Aqueous	PFPeA	PFAS by ID	380		ng/L	43
019	MW-12-13_021523	Aqueous	PFBS	PFAS by ID	1.7	J	ng/L	45
019	MW-12-13_021523	Aqueous	PFBA	PFAS by ID	28		ng/L	45
019	MW-12-13_021523	Aqueous	PFHpA	PFAS by ID	22		ng/L	45
019	MW-12-13_021523	Aqueous	PFHxA	PFAS by ID	69		ng/L	45
019	MW-12-13_021523	Aqueous	PFOA	PFAS by ID	4.9		ng/L	45
019	MW-12-13_021523	Aqueous	PFPeA	PFAS by ID	41		ng/L	45
020	DUP-05_021523	Aqueous	PFBS	PFAS by ID	0.85	J	ng/L	47
020	DUP-05_021523	Aqueous	PFHxS	PFAS by ID	1.2	J	ng/L	47
020	DUP-05_021523	Aqueous	PFBA	PFAS by ID	35		ng/L	47

Detection Summary (Continued)

Lot Number: YB17038

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
020	DUP-05_021523	Aqueous	PFDA	PFAS by ID	10		ng/L	47
020	DUP-05_021523	Aqueous	PFHpA	PFAS by ID	31		ng/L	47
020	DUP-05_021523	Aqueous	PFHxA	PFAS by ID	88		ng/L	47
020	DUP-05_021523	Aqueous	PFNA	PFAS by ID	5.4		ng/L	47
020	DUP-05_021523	Aqueous	PFOA	PFAS by ID	69		ng/L	47
020	DUP-05_021523	Aqueous	PFPeA	PFAS by ID	55		ng/L	47
020	DUP-05_021523	Aqueous	PFOS	PFAS by ID	33		ng/L	47

(146 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-001**

Description: **MW-22-143_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1305** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2110	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**17**		**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.5**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	157	25-150
13C2_6:2FTS		112	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		92	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		102	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		100	25-150
13C7_PFUdA		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-001**

Description: **MW-22-143_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1305** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-002**

Description: **MW-22-144_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1410** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2123	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.5**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.4**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.7**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		106	25-150
13C4_PFBA		70	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-002**

Description: **MW-22-144_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1410** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		109	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-003**

Description: **MW-22-145_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1450** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2136	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.4**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.9**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.5**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**11**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.1**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		130	25-150
13C2_6:2FTS		112	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		104	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-003**

Description: **MW-22-145_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1450** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-004**

Description: **MW-22-146_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1540** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2227	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.55**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.60**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.1**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		141	25-150
13C2_6:2FTS		119	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		109	25-150
13C3-HFPO-DA		107	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		113	25-150
13C5_PFPeA		103	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-004**

Description: **MW-22-146_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1540** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		111	25-150
13C8_PFOS		106	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		106	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-005**

Description: **DUP-07_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2240	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.57**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.8**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		143	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		109	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		111	25-150
13C3-HFPO-DA		112	25-150
13C4_PFBA		72	25-150
13C4_PFHpA		112	25-150
13C5_PFHxA		115	25-150
13C5_PFPeA		108	25-150
13C6_PFDA		111	25-150
13C7_PFUdA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB17038-005**
Description: **DUP-07_021323**		Matrix: **Aqueous**
Date Sampled: **02/13/2023**	Project Name: **RACER Lansing**	
Date Received: **02/17/2023**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	25-150
13C8_PFOS		107	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		116	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		109	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-006**

Description: **MW-22-158_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1640** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2253	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		144	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		92	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		102	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-006**

Description: **MW-22-158_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1640** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		105	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-007**

Description: **MW-22-152_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1355** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2306	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**11**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.55**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.0**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.4**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.4**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	174	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		92	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		111	25-150
13C3-HFPO-DA		106	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		113	25-150
13C5_PFHxA		111	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-007**

Description: **MW-22-152_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1355** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		114	25-150
13C8_PFOS		107	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		113	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-008**

Description: **MW-22-151_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1505** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2318	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.6**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.6**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.0**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.7**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	270	25-150
13C2_6:2FTS	N	226	25-150
13C2_8:2FTS	N	152	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		29	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		66	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		104	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-008**
Description: **MW-22-151_021323**
Matrix: **Aqueous**
Date Sampled: **02/13/2023 1505**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		111	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		109	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-009**

Description: **MW-22-150_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1555** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/21/2023 2331	BWS	02/17/2023 1805	67896

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.62	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.59	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.3	0.46	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.6**	**J**	**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.3	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.3	0.57	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.3	0.38	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.3	0.69	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.0**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.3	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	262	25-150
13C2_6:2FTS	N	151	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		28	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		68	25-150
13C6_PFDA		100	25-150
13C7_PFUdA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-009**

Description: **MW-22-150_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1555** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-010**

Description: **MW-22-149_021323** Matrix: **Aqueous**

Date Sampled: **02/13/2023 1655** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/28/2023 2256	BWS	02/21/2023 1746	68042

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**7.7**		**6.7**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.52**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.52**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.66**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	25-150
13C2_6:2FTS		93	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		97	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-010**
Description: **MW-22-149_021323**
Matrix: **Aqueous**
Date Sampled: **02/13/2023 1655**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-011**

Description: **MW-22-160_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1400** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/28/2023 2309	BWS	02/21/2023 1746	68042

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**8.3**		**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.93**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		78	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		74	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-011**
Description: **MW-22-160_021423**
Matrix: **Aqueous**
Date Sampled: **02/14/2023 1400**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		76	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-012**

Description: **MW-14-67_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1510** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/28/2023 2322	BWS	02/21/2023 1746	68042

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**8.3**		**6.8**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**49**	**Q**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**30**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**79**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.62**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**58**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	152	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		65	25-150
13C4_PFBA	N	19	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		69	25-150
13C5_PFPeA		46	25-150
13C6_PFDA		87	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-012**
Description: **MW-14-67_021423**
Matrix: **Aqueous**
Date Sampled: **02/14/2023 1510**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-013**

Description: **MW-13-36R_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1605** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1940	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**6.3**	**J**	**6.7**	**0.62**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**4.3**	**J**	**6.7**	**0.78**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.2**	**J**	**3.3**	**0.34**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.41	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.59	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**3.7**		**3.3**	**0.51**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**22**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**25**		**3.3**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.49**	**J**	**3.3**	**0.39**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**32**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**35**		**3.3**	**0.57**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**15**		**3.3**	**0.38**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**71**		**3.3**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**30**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.80**	**J**	**3.3**	**0.52**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**44**		**3.3**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	231	25-150
13C2_6:2FTS	N	252	25-150
13C2_8:2FTS	N	268	25-150
13C2_PFDoA		116	25-150
13C2_PFTeDA		113	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		74	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		72	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		108	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-013**
Description: **MW-13-36R_021423**
Matrix: **Aqueous**
Date Sampled: **02/14/2023 1605**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		133	25-150
d3-MeFOSAA		126	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-014**

Description: **MW-22-148_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1255** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1953	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.88**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		95	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-014**

Description: **MW-22-148_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1255** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-015**

Description: **MW-22-147_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1415** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2031	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.4**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.98**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.6**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		114	25-150
13C2_6:2FTS		78	25-150
13C2_8:2FTS		67	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		68	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-015**

Description: **MW-22-147_021423** Matrix: **Aqueous**

Date Sampled: **02/14/2023 1415** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-016**

Description: **P6-SB-07_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1055** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2044	BWS	02/22/2023 1310	68045
2	SOP SPE	PFAS by ID SOP	10	02/28/2023 1400	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**6.2**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.62**	**J**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.6**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**410**		**34**	**5.1**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**56**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1200**		**34**	**3.8**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1500**		**34**	**5.8**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**220**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1600**		**34**	**7.0**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1400**		**34**	**4.6**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**110**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	189	25-150	N	174	25-150
13C2_6:2FTS		145	25-150		150	25-150
13C2_8:2FTS		149	25-150		125	25-150
13C2_PFDoA		106	25-150		136	25-150
13C2_PFTeDA		93	25-150		125	25-150
13C3_PFBS		84	25-150		133	25-150
13C3_PFHxS		88	25-150		132	25-150
13C3-HFPO-DA		71	25-150		124	25-150
13C4_PFBA		36	25-150		106	25-150
13C4_PFHpA		81	25-150		137	25-150
13C5_PFHxA		74	25-150		138	25-150
13C5_PFPeA		57	25-150		126	25-150
13C6_PFDA		107	25-150		137	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-016**

Description: **P6-SB-07_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1055** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		113	25-150		129	25-150
13C8_PFOA		82	25-150		138	25-150
13C8_PFOS		94	25-150		130	25-150
13C8_PFOSA		97	10-150		122	10-150
13C9_PFNA		105	25-150		133	25-150
d5-EtFOSAA		118	25-150		125	25-150
d3-MeFOSAA		117	25-150		141	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-017**

Description: **MW-12-12_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1155** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/02/2023 1429	OMNS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.62	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.43**	**J**	**3.3**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.59	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**38**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**11**		**3.3**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**32**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**97**		**3.3**	**0.57**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.9**		**3.3**	**0.38**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**78**		**3.3**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**65**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**36**		**3.3**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	211	25-150
13C2_6:2FTS	N	220	25-150
13C2_8:2FTS		145	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		62	25-150
13C3_PFBS		69	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		59	25-150
13C4_PFBA		37	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		70	25-150
13C5_PFPeA		51	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-017**
Description: **MW-12-12_021523**
Matrix: **Aqueous**
Date Sampled: **02/15/2023 1155**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-018**

Description: **MW-14-70_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1315** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2109	BWS	02/22/2023 1310	68045
2	SOP SPE	PFAS by ID SOP	5	02/28/2023 1413	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.59**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**100**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**110**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**310**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**380**		**17**	**2.3**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		138	25-150		104	25-150
13C2_6:2FTS		96	25-150		114	25-150
13C2_8:2FTS		92	25-150		95	25-150
13C2_PFDoA		96	25-150		105	25-150
13C2_PFTeDA		100	25-150		104	25-150
13C3_PFBS		97	25-150		113	25-150
13C3_PFHxS		100	25-150		110	25-150
13C3-HFPO-DA		86	25-150		104	25-150
13C4_PFBA		46	25-150		81	25-150
13C4_PFHpA		101	25-150		112	25-150
13C5_PFHxA		96	25-150		115	25-150
13C5_PFPeA		73	25-150		102	25-150
13C6_PFDA		97	25-150		104	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-018**

Description: **MW-14-70_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1315** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		96	25-150		109	25-150
13C8_PFOA		102	25-150		113	25-150
13C8_PFOS		96	25-150		109	25-150
13C8_PFOSA		92	10-150		102	10-150
13C9_PFNA		104	25-150		108	25-150
d5-EtFOSAA		89	25-150		100	25-150
d3-MeFOSAA		94	25-150		107	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-019**

Description: **MW-12-13_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1420** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2122	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**28**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**22**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**69**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**41**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	159	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-019**

Description: **MW-12-13_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1420** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-020**

Description: **DUP-05_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2200	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.85**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**35**		**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**10**		**3.4**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**31**		**3.4**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**88**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.4**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**69**		**3.4**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**55**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**33**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		136	25-150
13C2_6:2FTS		119	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		58	25-150
13C3_PFBS		60	25-150
13C3_PFHxS		62	25-150
13C3-HFPO-DA		51	25-150
13C4_PFBA		28	25-150
13C4_PFHpA		63	25-150
13C5_PFHxA		58	25-150
13C5_PFPeA		46	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-020**

Description: **DUP-05_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		66	25-150
13C8_PFOS		65	25-150
13C8_PFOSA		65	10-150
13C9_PFNA		73	25-150
d5-EtFOSAA		68	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB17038-021**

Description: **EB-01_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1000** Project Name: **RACER Lansing**

Date Received: **02/17/2023** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 2213	BWS	02/22/2023 1310	68045

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	25-150
13C2_6:2FTS		93	25-150
13C2_8:2FTS		88	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB17038-021**
Description: **EB-01_021523**
Matrix: **Aqueous**
Date Sampled: **02/15/2023 1000**
Project Name: **RACER Lansing**
Date Received: **02/17/2023**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ67896-001
Batch: 67896
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	02/21/2023 1825
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	02/21/2023 1825
8:2 FTS	ND		1	8.0	1.6	ng/L	02/21/2023 1825
6:2 FTS	ND		1	8.0	2.0	ng/L	02/21/2023 1825
4:2 FTS	ND		1	8.0	0.87	ng/L	02/21/2023 1825
GenX	ND		1	8.0	2.1	ng/L	02/21/2023 1825
ADONA	ND		1	8.0	0.48	ng/L	02/21/2023 1825
EtFOSAA	ND		1	8.0	0.75	ng/L	02/21/2023 1825
MeFOSAA	ND		1	8.0	0.93	ng/L	02/21/2023 1825
PFBS	ND		1	4.0	0.41	ng/L	02/21/2023 1825
PFDS	ND		1	4.0	0.78	ng/L	02/21/2023 1825
PFHpS	ND		1	4.0	0.50	ng/L	02/21/2023 1825
PFNS	ND		1	4.0	0.71	ng/L	02/21/2023 1825
PFOSA	ND		1	4.0	0.61	ng/L	02/21/2023 1825
PFPeS	ND		1	4.0	0.59	ng/L	02/21/2023 1825
PFHxS	ND		1	4.0	0.55	ng/L	02/21/2023 1825
PFBA	ND		1	4.0	0.60	ng/L	02/21/2023 1825
PFDA	ND		1	4.0	0.52	ng/L	02/21/2023 1825
PFDoA	ND		1	4.0	0.47	ng/L	02/21/2023 1825
PFHpA	ND		1	4.0	0.45	ng/L	02/21/2023 1825
PFHxA	ND		1	4.0	0.69	ng/L	02/21/2023 1825
PFNA	ND		1	4.0	0.46	ng/L	02/21/2023 1825
PFOA	ND		1	4.0	0.83	ng/L	02/21/2023 1825
PFPeA	ND		1	4.0	0.54	ng/L	02/21/2023 1825
PFTeDA	ND		1	4.0	0.60	ng/L	02/21/2023 1825
PFTrDA	ND		1	4.0	0.53	ng/L	02/21/2023 1825
PFUdA	ND		1	4.0	0.63	ng/L	02/21/2023 1825
PFOS	ND		1	4.0	2.0	ng/L	02/21/2023 1825

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		110	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		106	25-150
13C4_PFBA		108	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ67896-001
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		107	25-150
13C8_PFOA		109	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ67896-002
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	50-150	02/21/2023 1837
11Cl-PF3OUdS	15	13		1	84	50-150	02/21/2023 1837
8:2 FTS	15	17		1	112	50-150	02/21/2023 1837
6:2 FTS	15	17		1	114	50-150	02/21/2023 1837
4:2 FTS	15	17		1	117	50-150	02/21/2023 1837
GenX	32	37		1	116	50-150	02/21/2023 1837
ADONA	15	16		1	105	50-150	02/21/2023 1837
EtFOSAA	16	18		1	114	50-150	02/21/2023 1837
MeFOSAA	16	18		1	111	50-150	02/21/2023 1837
PFBS	14	15		1	104	50-150	02/21/2023 1837
PFDS	15	14		1	89	50-150	02/21/2023 1837
PFHpS	15	16		1	102	50-150	02/21/2023 1837
PFNS	15	16		1	101	50-150	02/21/2023 1837
PFOSA	16	18		1	111	50-150	02/21/2023 1837
PFPeS	15	16		1	107	50-150	02/21/2023 1837
PFHxS	15	15		1	102	50-150	02/21/2023 1837
PFBA	16	17		1	106	50-150	02/21/2023 1837
PFDA	16	17		1	108	50-150	02/21/2023 1837
PFDoA	16	17		1	106	50-150	02/21/2023 1837
PFHpA	16	17		1	106	50-150	02/21/2023 1837
PFHxA	16	17		1	105	50-150	02/21/2023 1837
PFNA	16	16		1	102	50-150	02/21/2023 1837
PFOA	16	17		1	107	50-150	02/21/2023 1837
PFPeA	16	16		1	102	50-150	02/21/2023 1837
PFTeDA	16	15		1	91	50-150	02/21/2023 1837
PFTrDA	16	15		1	95	50-150	02/21/2023 1837
PFUdA	16	17		1	105	50-150	02/21/2023 1837
PFOS	15	16		1	105	50-150	02/21/2023 1837

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		58	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ67896-002
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		102	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB17038-003MS
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	7.8		1	57	50-150	02/21/2023 2149
11Cl-PF3OUdS	ND	14	7.4		1	54	50-150	02/21/2023 2149
8:2 FTS	ND	14	8.4		1	61	50-150	02/21/2023 2149
6:2 FTS	ND	14	8.1		1	59	50-150	02/21/2023 2149
4:2 FTS	ND	14	8.9		1	66	50-150	02/21/2023 2149
GenX	ND	29	19		1	64	50-150	02/21/2023 2149
ADONA	ND	14	8.1		1	59	50-150	02/21/2023 2149
EtFOSAA	ND	15	9.2		1	63	50-150	02/21/2023 2149
MeFOSAA	ND	15	9.0		1	62	50-150	02/21/2023 2149
PFBS	3.4	13	11		1	56	50-150	02/21/2023 2149
PFDS	ND	14	7.7		1	55	50-150	02/21/2023 2149
PFHpS	ND	14	8.0		1	58	50-150	02/21/2023 2149
PFNS	ND	14	8.0		1	58	50-150	02/21/2023 2149
PFOSA	ND	15	9.4		1	65	50-150	02/21/2023 2149
PFPeS	ND	14	8.3		1	61	50-150	02/21/2023 2149
PFHxS	1.7	13	9.2		1	57	50-150	02/21/2023 2149
PFBA	4.9	15	13		1	56	50-150	02/21/2023 2149
PFDA	ND	15	8.7		1	60	50-150	02/21/2023 2149
PFDoA	ND	15	7.4		1	51	50-150	02/21/2023 2149
PFHpA	3.9	15	13		1	60	50-150	02/21/2023 2149
PFHxA	5.5	15	14		1	58	50-150	02/21/2023 2149
PFNA	ND	15	9.0		1	62	50-150	02/21/2023 2149
PFOA	11	15	18		1	50	50-150	02/21/2023 2149
PFPeA	5.1	15	14		1	60	50-150	02/21/2023 2149
PFTeDA	ND	15	8.3		1	57	50-150	02/21/2023 2149
PFTrDA	ND	15	8.0		1	55	50-150	02/21/2023 2149
PFUdA	ND	15	9.1		1	63	50-150	02/21/2023 2149
PFOS	ND	13	8.3		1	62	50-150	02/21/2023 2149

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		127	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		109	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		109	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		104	25-150
13C4_PFBA		65	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		110	25-150
13C5_PFPeA		104	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB17038-003MS
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		97	25-150
13C8_PFOA		111	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YB17038-009DU
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	02/21/2023 2344
11Cl-PF3OUdS	ND	ND		1	0.00	20	02/21/2023 2344
8:2 FTS	ND	ND		1	0.00	20	02/21/2023 2344
6:2 FTS	ND	ND		1	0.00	20	02/21/2023 2344
4:2 FTS	ND	ND		1	0.00	20	02/21/2023 2344
GenX	ND	ND		1	0.00	20	02/21/2023 2344
ADONA	ND	ND		1	0.00	20	02/21/2023 2344
EtFOSAA	ND	ND		1	0.00	20	02/21/2023 2344
MeFOSAA	ND	ND		1	0.00	20	02/21/2023 2344
PFBS	ND	ND		1	0.00	20	02/21/2023 2344
PFDS	ND	ND		1	0.00	20	02/21/2023 2344
PFHpS	ND	ND		1	0.00	20	02/21/2023 2344
PFNS	ND	ND		1	0.00	20	02/21/2023 2344
PFOSA	ND	ND		1	0.00	20	02/21/2023 2344
PFPeS	ND	ND		1	0.00	20	02/21/2023 2344
PFHxS	ND	ND		1	0.00	20	02/21/2023 2344
PFBA	2.6	2.8	J	1	7.8	20	02/21/2023 2344
PFDA	ND	ND		1	0.00	20	02/21/2023 2344
PFDoA	ND	ND		1	0.00	20	02/21/2023 2344
PFHpA	ND	ND		1	0.00	20	02/21/2023 2344
PFHxA	ND	ND		1	0.00	20	02/21/2023 2344
PFNA	ND	ND		1	0.00	20	02/21/2023 2344
PFOA	ND	ND		1	0.00	20	02/21/2023 2344
PFPeA	4.0	3.6		1	200	20	02/21/2023 2344
PFTeDA	ND	ND		1	0.00	20	02/21/2023 2344
PFTrDA	ND	ND		1	0.00	20	02/21/2023 2344
PFUdA	ND	ND		1	0.00	20	02/21/2023 2344
PFOS	ND	ND		1	0.00	20	02/21/2023 2344

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	264	25-150
13C2_6:2FTS	N	153	25-150
13C2_8:2FTS		109	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		31	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YB17038-009DU
Batch: 67896
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/17/2023 1805

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		105	25-150
13C7_PFUdA		98	25-150
13C8_PFOA		114	25-150
13C8_PFOS		107	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		112	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68042-001
Batch: 68042
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/21/2023 1746

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	02/28/2023 2023
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	02/28/2023 2023
8:2 FTS	ND		1	8.0	1.6	ng/L	02/28/2023 2023
6:2 FTS	ND		1	8.0	2.0	ng/L	02/28/2023 2023
4:2 FTS	ND		1	8.0	0.87	ng/L	02/28/2023 2023
GenX	ND		1	8.0	2.1	ng/L	02/28/2023 2023
ADONA	ND		1	8.0	0.48	ng/L	02/28/2023 2023
EtFOSAA	ND		1	8.0	0.75	ng/L	02/28/2023 2023
MeFOSAA	ND		1	8.0	0.93	ng/L	02/28/2023 2023
PFBS	ND		1	4.0	0.41	ng/L	02/28/2023 2023
PFDS	ND		1	4.0	0.78	ng/L	02/28/2023 2023
PFHpS	ND		1	4.0	0.50	ng/L	02/28/2023 2023
PFNS	ND		1	4.0	0.71	ng/L	02/28/2023 2023
PFOSA	ND		1	4.0	0.61	ng/L	02/28/2023 2023
PFPeS	ND		1	4.0	0.59	ng/L	02/28/2023 2023
PFHxS	ND		1	4.0	0.55	ng/L	02/28/2023 2023
PFBA	ND		1	4.0	0.60	ng/L	02/28/2023 2023
PFDA	ND		1	4.0	0.52	ng/L	02/28/2023 2023
PFDoA	ND		1	4.0	0.47	ng/L	02/28/2023 2023
PFHpA	ND		1	4.0	0.45	ng/L	02/28/2023 2023
PFHxA	ND		1	4.0	0.69	ng/L	02/28/2023 2023
PFNA	ND		1	4.0	0.46	ng/L	02/28/2023 2023
PFOA	ND		1	4.0	0.83	ng/L	02/28/2023 2023
PFPeA	ND		1	4.0	0.54	ng/L	02/28/2023 2023
PFTeDA	ND		1	4.0	0.60	ng/L	02/28/2023 2023
PFTrDA	ND		1	4.0	0.53	ng/L	02/28/2023 2023
PFUdA	ND		1	4.0	0.63	ng/L	02/28/2023 2023
PFOS	ND		1	4.0	2.0	ng/L	02/28/2023 2023

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		78	25-150
13C2_6:2FTS		88	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		93	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68042-001
Batch: 68042
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/21/2023 1746

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		96	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68042-002
Batch: 68042
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/21/2023 1746

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	98	50-150	02/28/2023 2036
11Cl-PF3OUdS	15	14		1	93	50-150	02/28/2023 2036
8:2 FTS	15	17		1	114	50-150	02/28/2023 2036
6:2 FTS	15	15		1	100	50-150	02/28/2023 2036
4:2 FTS	15	17		1	111	50-150	02/28/2023 2036
GenX	32	36		1	112	50-150	02/28/2023 2036
ADONA	15	15		1	100	50-150	02/28/2023 2036
EtFOSAA	16	18		1	110	50-150	02/28/2023 2036
MeFOSAA	16	18		1	109	50-150	02/28/2023 2036
PFBS	14	15		1	105	50-150	02/28/2023 2036
PFDS	15	15		1	96	50-150	02/28/2023 2036
PFHpS	15	16		1	103	50-150	02/28/2023 2036
PFNS	15	15		1	99	50-150	02/28/2023 2036
PFOSA	16	18		1	112	50-150	02/28/2023 2036
PFPeS	15	16		1	106	50-150	02/28/2023 2036
PFHxS	15	14		1	98	50-150	02/28/2023 2036
PFBA	16	16		1	103	50-150	02/28/2023 2036
PFDA	16	17		1	103	50-150	02/28/2023 2036
PFDoA	16	16		1	101	50-150	02/28/2023 2036
PFHpA	16	17		1	106	50-150	02/28/2023 2036
PFHxA	16	16		1	103	50-150	02/28/2023 2036
PFNA	16	17		1	105	50-150	02/28/2023 2036
PFOA	16	16		1	100	50-150	02/28/2023 2036
PFPeA	16	17		1	107	50-150	02/28/2023 2036
PFTeDA	16	16		1	100	50-150	02/28/2023 2036
PFTrDA	16	16		1	102	50-150	02/28/2023 2036
PFUdA	16	16		1	98	50-150	02/28/2023 2036
PFOS	15	15		1	103	50-150	02/28/2023 2036

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		77	25-150
13C2_6:2FTS		90	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		92	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68042-002
Batch: 68042
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/21/2023 1746

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		96	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68045-001
Batch: 68045
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	02/24/2023 1745
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	02/24/2023 1745
8:2 FTS	ND		1	8.0	1.6	ng/L	02/24/2023 1745
6:2 FTS	ND		1	8.0	2.0	ng/L	02/24/2023 1745
4:2 FTS	ND		1	8.0	0.87	ng/L	02/24/2023 1745
GenX	ND		1	8.0	2.1	ng/L	02/24/2023 1745
ADONA	ND		1	8.0	0.48	ng/L	02/24/2023 1745
EtFOSAA	ND		1	8.0	0.75	ng/L	02/24/2023 1745
MeFOSAA	ND		1	8.0	0.93	ng/L	02/24/2023 1745
PFBS	ND		1	4.0	0.41	ng/L	02/24/2023 1745
PFDS	ND		1	4.0	0.78	ng/L	02/24/2023 1745
PFHpS	ND		1	4.0	0.50	ng/L	02/24/2023 1745
PFNS	ND		1	4.0	0.71	ng/L	02/24/2023 1745
PFOSA	ND		1	4.0	0.61	ng/L	02/24/2023 1745
PFPeS	ND		1	4.0	0.59	ng/L	02/24/2023 1745
PFHxS	ND		1	4.0	0.55	ng/L	02/24/2023 1745
PFBA	ND		1	4.0	0.60	ng/L	02/24/2023 1745
PFDA	ND		1	4.0	0.52	ng/L	02/24/2023 1745
PFDoA	ND		1	4.0	0.47	ng/L	02/24/2023 1745
PFHpA	ND		1	4.0	0.45	ng/L	02/24/2023 1745
PFHxA	ND		1	4.0	0.69	ng/L	02/24/2023 1745
PFNA	ND		1	4.0	0.46	ng/L	02/24/2023 1745
PFOA	ND		1	4.0	0.83	ng/L	02/24/2023 1745
PFPeA	ND		1	4.0	0.54	ng/L	02/24/2023 1745
PFTeDA	ND		1	4.0	0.60	ng/L	02/24/2023 1745
PFTrDA	ND		1	4.0	0.53	ng/L	02/24/2023 1745
PFUdA	ND		1	4.0	0.63	ng/L	02/24/2023 1745
PFOS	ND		1	4.0	2.0	ng/L	02/24/2023 1745

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		91	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68045-001
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		95	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68045-002
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	101	50-150	02/24/2023 1758
11Cl-PF3OUdS	15	14		1	92	50-150	02/24/2023 1758
8:2 FTS	15	16		1	107	50-150	02/24/2023 1758
6:2 FTS	15	17		1	111	50-150	02/24/2023 1758
4:2 FTS	15	17		1	113	50-150	02/24/2023 1758
GenX	32	36		1	113	50-150	02/24/2023 1758
ADONA	15	15		1	103	50-150	02/24/2023 1758
EtFOSAA	16	18		1	114	50-150	02/24/2023 1758
MeFOSAA	16	16		1	102	50-150	02/24/2023 1758
PFBS	14	14		1	102	50-150	02/24/2023 1758
PFDS	15	15		1	94	50-150	02/24/2023 1758
PFHpS	15	15		1	100	50-150	02/24/2023 1758
PFNS	15	15		1	99	50-150	02/24/2023 1758
PFOSA	16	17		1	109	50-150	02/24/2023 1758
PFPeS	15	15		1	103	50-150	02/24/2023 1758
PFHxS	15	14		1	100	50-150	02/24/2023 1758
PFBA	16	16		1	103	50-150	02/24/2023 1758
PFDA	16	17		1	103	50-150	02/24/2023 1758
PFDoA	16	17		1	104	50-150	02/24/2023 1758
PFHpA	16	16		1	102	50-150	02/24/2023 1758
PFHxA	16	16		1	102	50-150	02/24/2023 1758
PFNA	16	17		1	109	50-150	02/24/2023 1758
PFOA	16	16		1	103	50-150	02/24/2023 1758
PFPeA	16	16		1	103	50-150	02/24/2023 1758
PFTeDA	16	17		1	106	50-150	02/24/2023 1758
PFTrDA	16	16		1	98	50-150	02/24/2023 1758
PFUdA	16	18		1	110	50-150	02/24/2023 1758
PFOS	15	16		1	105	50-150	02/24/2023 1758

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		88	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		94	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68045-002
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		96	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		98	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB17038-014MS
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	102	50-150	02/24/2023 2005
11Cl-PF3OUdS	ND	14	14		1	95	50-150	02/24/2023 2005
8:2 FTS	ND	15	17		1	116	50-150	02/24/2023 2005
6:2 FTS	ND	14	15		1	103	50-150	02/24/2023 2005
4:2 FTS	ND	14	16		1	113	50-150	02/24/2023 2005
GenX	ND	30	35		1	115	50-150	02/24/2023 2005
ADONA	ND	14	15		1	105	50-150	02/24/2023 2005
EtFOSAA	ND	15	17		1	111	50-150	02/24/2023 2005
MeFOSAA	ND	15	17		1	109	50-150	02/24/2023 2005
PFBS	1.7	13	15		1	103	50-150	02/24/2023 2005
PFDS	ND	15	14		1	95	50-150	02/24/2023 2005
PFHpS	ND	14	15		1	102	50-150	02/24/2023 2005
PFNS	ND	15	15		1	100	50-150	02/24/2023 2005
PFOSA	ND	15	17		1	115	50-150	02/24/2023 2005
PFPeS	ND	14	15		1	104	50-150	02/24/2023 2005
PFHxS	ND	14	14		1	98	50-150	02/24/2023 2005
PFBA	0.88	15	16		1	101	50-150	02/24/2023 2005
PFDA	ND	15	16		1	105	50-150	02/24/2023 2005
PFDoA	ND	15	16		1	103	50-150	02/24/2023 2005
PFHpA	ND	15	15		1	102	50-150	02/24/2023 2005
PFHxA	ND	15	16		1	105	50-150	02/24/2023 2005
PFNA	ND	15	16		1	103	50-150	02/24/2023 2005
PFOA	ND	15	16		1	106	50-150	02/24/2023 2005
PFPeA	ND	15	16		1	105	50-150	02/24/2023 2005
PFTeDA	ND	15	16		1	104	50-150	02/24/2023 2005
PFTrDA	ND	15	15		1	101	50-150	02/24/2023 2005
PFUdA	ND	15	16		1	104	50-150	02/24/2023 2005
PFOS	ND	14	15		1	104	50-150	02/24/2023 2005

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		88	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB17038-014MS
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		96	25-150
13C7_PFUdA		96	25-150
13C8_PFOA		98	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB17038-014MD
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	101	3.9	50-150	30	02/24/2023 2018
11Cl-PF3OUdS	ND	14	13		1	92	6.0	50-150	30	02/24/2023 2018
8:2 FTS	ND	14	16		1	116	2.6	50-150	30	02/24/2023 2018
6:2 FTS	ND	14	15		1	109	2.5	50-150	30	02/24/2023 2018
4:2 FTS	ND	14	16		1	119	2.4	50-150	30	02/24/2023 2018
GenX	ND	30	33		1	113	4.9	50-150	30	02/24/2023 2018
ADONA	ND	14	15		1	106	1.1	50-150	30	02/24/2023 2018
EtFOSAA	ND	15	16		1	110	3.8	50-150	30	02/24/2023 2018
MeFOSAA	ND	15	16		1	111	1.4	50-150	30	02/24/2023 2018
PFBS	1.7	13	15		1	105	0.38	50-150	30	02/24/2023 2018
PFDS	ND	14	13		1	91	7.9	50-150	30	02/24/2023 2018
PFHpS	ND	14	15		1	104	0.33	50-150	30	02/24/2023 2018
PFNS	ND	14	14		1	102	1.3	50-150	30	02/24/2023 2018
PFOSA	ND	15	17		1	113	4.4	50-150	30	02/24/2023 2018
PFPeS	ND	14	15		1	107	0.037	50-150	30	02/24/2023 2018
PFHxS	ND	13	13		1	100	0.96	50-150	30	02/24/2023 2018
PFBA	0.88	15	16		1	102	1.7	50-150	30	02/24/2023 2018
PFDA	ND	15	16		1	106	1.6	50-150	30	02/24/2023 2018
PFDoA	ND	15	15		1	102	4.1	50-150	30	02/24/2023 2018
PFHpA	ND	15	16		1	105	0.64	50-150	30	02/24/2023 2018
PFHxA	ND	15	15		1	103	5.1	50-150	30	02/24/2023 2018
PFNA	ND	15	15		1	105	1.5	50-150	30	02/24/2023 2018
PFOA	ND	15	15		1	105	4.5	50-150	30	02/24/2023 2018
PFPeA	ND	15	15		1	105	3.0	50-150	30	02/24/2023 2018
PFTeDA	ND	15	16		1	107	0.44	50-150	30	02/24/2023 2018
PFTrDA	ND	15	15		1	102	2.4	50-150	30	02/24/2023 2018
PFUdA	ND	15	15		1	101	6.1	50-150	30	02/24/2023 2018
PFOS	ND	14	15		1	106	0.70	50-150	30	02/24/2023 2018

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		83	25-150
13C4_PFHpA		102	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB17038-014MD
Batch: 68045
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1310

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		102	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

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www.pacelabs.com

Number 138329

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 941-777-5215 Kaitlin.Hunt@arcadis.com
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)
City: Novi	State: MI	Zip Code: 48377
Project Name: RACER Lansing	Printed Name: Austin Westhuis	
Project No.: 30112892.0370A	P.O. No.	

Quote No.

Page 1 of

YB17038

KEIO

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab G / Composite C	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS Method 537 Isotope Dilution List (Table 3, 5.1 per QSM)	Remarks / Cooler ID.
MW-22-143_021323	2/13/23	1305	G	X			2							X	
MW-22-144_021323	2/13/23	1410	G	X			2							X	
MW-22-145_021323	2/13/23	1450	G	X			2							X	
MW-22-146_021323	2/13/23	1540	G	X			2							X	
Dup-07_021323	2/13/23	—	G	X			2							X	
MW-22-158_021323	2/13/23	1640	G	X			2							X	
MW-22-152_021323	2/13/23	1355	G	X			2							X	
MW-22-151_021323	2/13/23	1505	G	X			2							X	
MW-22-150_021323	2/13/23	1555	G	X			2							X	
MW-22-149_021323	2/13/23	1655	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis / Arcadis	2/15/23	15:25	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	2/17/23	950	4. Laboratory received by	2/17/23	950

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 3.5 °C — Temp Blank ☐ Y ☒ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 146138

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 947-777-5215 kaitlin.hunt@arcadis.com
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x [signature]	Quote No.
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis	Page 2 of
Project Name: RACER Lansing		YB17038 KDS2
Project No.: 30112892.03704	P.O. No.	Analysis (Attach list if more space is needed)

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Composition	Matrix: Aqueous	Matrix: Soil	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	8260 Full List + Naphthalene, 1,2,3-TCB, 1,2,4-TCB, Ethanol, Isopropanol, Freon 12	Remarks / Cooler I.D.
MW-22-160_021423	2/14/23	1400	G	X			2							X	
MW-14-67_021423	2/14/23	1510	G	X			2							X	
MW-13-36R_021423	2/14/23	1605	G	X			2							X	
MW-22-148_021423	2/14/23	1255	G	X			6							X	MS/MSD
MW-22-147_021423	2/14/23	1415	G	X			2							X	
PG-SB-07_021523	2/15/23	1055	G	X			2							X	
MW-12-12_021523	2/15/23	11:55	G	X			2							X	
MW-14-70_021523	2/15/23	13:15	G	X			2							X	
MW-12-13_021523	2/15/23	14:20	G	X			2							X	
Dup-05_021523	2/15/23	—	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: [signature] Austin Westhuis / Arcadis	2/15/23	15:25	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx [signature] 2/17/23	2/17/23	950	4. Laboratory received by: [signature]	2/17/23	950

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): Yes No Ice Pack — Receipt Temp: 3.5 °C — Temp Blank: ☐ Y N/A

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: IAE0033N2-01

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Number 146138

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 947-777-5215 Kaitlin.Hunt@arcadis.com
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x	Quote No.
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis	Page 3 of
Project Name: PACER Lansing		YB17038
Project No.: 30112892.0370A	P.O. No.	KER2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Soil	Non-Aqueous	No. of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS analysis (537mod) (Acceptable list of PFAS analytes per QSM 5.1)	Remarks / Cooler I.D.
EB-01_021523	2/15/23	10:00	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis / Arcadis	2/15/23	15:25	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	2/17/23	950	4. Laboratory received by	2/17/23	950

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack — Receipt Temp: 3.5 °C — Temp Blank ☐ Y ☒ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: IAE003N8-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: SAG / 02/17/2023 Lot #: YB17038

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.5 / 3.5 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? ____
☑ Yes	☐ No		11. Was adequate sample volume available?
☐ Yes	☑ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA ____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA ____ were received with bubbles >6 mm in diameter.

Samples(s) NA ____ were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER Lansing

Project Number: 30171056.0370A

Lot Number:**YB20004**

Date Completed:03/13/2023

Kathy Smith

03/13/2023 3:18 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
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106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YB20004

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Samples YB20004-001, YB20004-004, YB20004-005, YB20004-006, YB20004-007, YB20004-008 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside, the upper control limit: YB20004-002, YB20004-003, YB20004-004, YB20004-005, YB20004-006, YB20004-007, YB20004-008, YB20004-009. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YB20004

Project Name: RACER Lansing

Project Number: 30171056.0370A

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-18-98_021623	Aqueous	02/16/2023 1400	02/18/2023
002	MW-18-90_021623	Aqueous	02/16/2023 1450	02/18/2023
003	DUP-03_021623	Aqueous	02/16/2023	02/18/2023
004	MW-18-88_021623	Aqueous	02/16/2023 1540	02/18/2023
005	MW-18-99_021623	Aqueous	02/16/2023 1630	02/18/2023
006	MW-18-89_021723	Aqueous	02/17/2023 0910	02/18/2023
007	MW-18-91_021723	Aqueous	02/17/2023 0945	02/18/2023
008	MW-18-95_021723	Aqueous	02/17/2023 1030	02/18/2023
009	UNK-15_021723	Aqueous	02/17/2023 1120	02/18/2023
010	MW-18-103_021723	Aqueous	02/17/2023 1245	02/18/2023
011	MW-18-105_021723	Aqueous	02/17/2023 1335	02/18/2023

(11 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YB20004

Project Name: RACER Lansing

Project Number: 30171056.0370A

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-18-98_021623	Aqueous	PFBS	PFAS by ID	1.7	J	ng/L	7
001	MW-18-98_021623	Aqueous	PFBA	PFAS by ID	8.1		ng/L	7
001	MW-18-98_021623	Aqueous	PFHpA	PFAS by ID	0.76	J	ng/L	7
001	MW-18-98_021623	Aqueous	PFHxA	PFAS by ID	1.3	J	ng/L	7
001	MW-18-98_021623	Aqueous	PFNA	PFAS by ID	1.8	J	ng/L	7
001	MW-18-98_021623	Aqueous	PFOA	PFAS by ID	1.7	J	ng/L	7
001	MW-18-98_021623	Aqueous	PFOS	PFAS by ID	140		ng/L	7
002	MW-18-90_021623	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFDS	PFAS by ID	0.89	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFHpS	PFAS by ID	18		ng/L	9
002	MW-18-90_021623	Aqueous	PFOSA	PFAS by ID	0.86	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFPeS	PFAS by ID	2.6	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFHxS	PFAS by ID	17		ng/L	9
002	MW-18-90_021623	Aqueous	PFBA	PFAS by ID	9.8		ng/L	9
002	MW-18-90_021623	Aqueous	PFDA	PFAS by ID	1.6	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFHpA	PFAS by ID	3.7		ng/L	9
002	MW-18-90_021623	Aqueous	PFHxA	PFAS by ID	6.6		ng/L	9
002	MW-18-90_021623	Aqueous	PFNA	PFAS by ID	1.6	J	ng/L	9
002	MW-18-90_021623	Aqueous	PFOA	PFAS by ID	16		ng/L	9
002	MW-18-90_021623	Aqueous	PFOS	PFAS by ID	880		ng/L	9
003	DUP-03_021623	Aqueous	PFBS	PFAS by ID	1.7	J	ng/L	11
003	DUP-03_021623	Aqueous	PFDS	PFAS by ID	0.76	J	ng/L	11
003	DUP-03_021623	Aqueous	PFHpS	PFAS by ID	17		ng/L	11
003	DUP-03_021623	Aqueous	PFOSA	PFAS by ID	0.71	J	ng/L	11
003	DUP-03_021623	Aqueous	PFPeS	PFAS by ID	2.2	J	ng/L	11
003	DUP-03_021623	Aqueous	PFHxS	PFAS by ID	19		ng/L	11
003	DUP-03_021623	Aqueous	PFBA	PFAS by ID	9.1		ng/L	11
003	DUP-03_021623	Aqueous	PFDA	PFAS by ID	1.8	J	ng/L	11
003	DUP-03_021623	Aqueous	PFHpA	PFAS by ID	4.1		ng/L	11
003	DUP-03_021623	Aqueous	PFHxA	PFAS by ID	6.5		ng/L	11
003	DUP-03_021623	Aqueous	PFNA	PFAS by ID	1.5	J	ng/L	11
003	DUP-03_021623	Aqueous	PFOA	PFAS by ID	15		ng/L	11
003	DUP-03_021623	Aqueous	PFOS	PFAS by ID	830		ng/L	11
004	MW-18-88_021623	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFHpS	PFAS by ID	2.0	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFPeS	PFAS by ID	0.60	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFHxS	PFAS by ID	3.4	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFBA	PFAS by ID	8.8		ng/L	13
004	MW-18-88_021623	Aqueous	PFHpA	PFAS by ID	0.54	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFHxA	PFAS by ID	0.72	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFOA	PFAS by ID	6.1		ng/L	13
004	MW-18-88_021623	Aqueous	PFPeA	PFAS by ID	0.60	J	ng/L	13
004	MW-18-88_021623	Aqueous	PFOS	PFAS by ID	150		ng/L	13

Detection Summary (Continued)

Lot Number: YB20004

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	MW-18-99_021623	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFHpS	PFAS by ID	0.67	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFBA	PFAS by ID	9.7		ng/L	15
005	MW-18-99_021623	Aqueous	PFDA	PFAS by ID	0.85	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFHpA	PFAS by ID	2.3	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFHxA	PFAS by ID	3.9		ng/L	15
005	MW-18-99_021623	Aqueous	PFNA	PFAS by ID	1.3	J	ng/L	15
005	MW-18-99_021623	Aqueous	PFOA	PFAS by ID	4.8		ng/L	15
005	MW-18-99_021623	Aqueous	PFOS	PFAS by ID	56		ng/L	15
006	MW-18-89_021723	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	17
006	MW-18-89_021723	Aqueous	PFHpS	PFAS by ID	2.0	J	ng/L	17
006	MW-18-89_021723	Aqueous	PFPeS	PFAS by ID	0.68	J	ng/L	17
006	MW-18-89_021723	Aqueous	PFHxS	PFAS by ID	4.2		ng/L	17
006	MW-18-89_021723	Aqueous	PFBA	PFAS by ID	8.9		ng/L	17
006	MW-18-89_021723	Aqueous	PFDA	PFAS by ID	0.94	J	ng/L	17
006	MW-18-89_021723	Aqueous	PFHpA	PFAS by ID	3.7		ng/L	17
006	MW-18-89_021723	Aqueous	PFHxA	PFAS by ID	6.1		ng/L	17
006	MW-18-89_021723	Aqueous	PFNA	PFAS by ID	1.2	J	ng/L	17
006	MW-18-89_021723	Aqueous	PFOA	PFAS by ID	11		ng/L	17
006	MW-18-89_021723	Aqueous	PFOS	PFAS by ID	120		ng/L	17
007	MW-18-91_021723	Aqueous	PFDS	PFAS by ID	1.1	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFBA	PFAS by ID	8.9		ng/L	19
007	MW-18-91_021723	Aqueous	PFDA	PFAS by ID	0.79	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFHpA	PFAS by ID	2.3	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFHxA	PFAS by ID	3.1	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFNA	PFAS by ID	1.1	J	ng/L	19
007	MW-18-91_021723	Aqueous	PFOA	PFAS by ID	7.2		ng/L	19
007	MW-18-91_021723	Aqueous	PFOS	PFAS by ID	44		ng/L	19
008	MW-18-95_021723	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	21
008	MW-18-95_021723	Aqueous	PFBA	PFAS by ID	5.5		ng/L	21
008	MW-18-95_021723	Aqueous	PFHpA	PFAS by ID	0.62	J	ng/L	21
008	MW-18-95_021723	Aqueous	PFNA	PFAS by ID	0.68	J	ng/L	21
008	MW-18-95_021723	Aqueous	PFOA	PFAS by ID	2.9	J	ng/L	21
008	MW-18-95_021723	Aqueous	PFOS	PFAS by ID	29		ng/L	21
009	UNK-15_021723	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	23
009	UNK-15_021723	Aqueous	PFHpS	PFAS by ID	13		ng/L	23
009	UNK-15_021723	Aqueous	PFHxS	PFAS by ID	16		ng/L	23
009	UNK-15_021723	Aqueous	PFBA	PFAS by ID	15		ng/L	23
009	UNK-15_021723	Aqueous	PFDA	PFAS by ID	3.1	J	ng/L	23
009	UNK-15_021723	Aqueous	PFHpA	PFAS by ID	6.3		ng/L	23
009	UNK-15_021723	Aqueous	PFHxA	PFAS by ID	11		ng/L	23
009	UNK-15_021723	Aqueous	PFNA	PFAS by ID	5.0		ng/L	23
009	UNK-15_021723	Aqueous	PFOA	PFAS by ID	30		ng/L	23
009	UNK-15_021723	Aqueous	PFPeA	PFAS by ID	10		ng/L	23
009	UNK-15_021723	Aqueous	PFOS	PFAS by ID	1100		ng/L	23
010	MW-18-103_021723	Aqueous	PFBS	PFAS by ID	15		ng/L	25

Detection Summary (Continued)

Lot Number: YB20004

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
010	MW-18-103_021723	Aqueous	PFPeS	PFAS by ID	14		ng/L	25
010	MW-18-103_021723	Aqueous	PFHxS	PFAS by ID	100		ng/L	25
010	MW-18-103_021723	Aqueous	PFBA	PFAS by ID	15		ng/L	25
010	MW-18-103_021723	Aqueous	PFHpA	PFAS by ID	0.53	J	ng/L	25
010	MW-18-103_021723	Aqueous	PFHxA	PFAS by ID	4.8		ng/L	25
010	MW-18-103_021723	Aqueous	PFOA	PFAS by ID	1.6	J	ng/L	25
010	MW-18-103_021723	Aqueous	PFPeA	PFAS by ID	4.5		ng/L	25
010	MW-18-103_021723	Aqueous	PFOS	PFAS by ID	4.5		ng/L	25
011	MW-18-105_021723	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	27
011	MW-18-105_021723	Aqueous	PFHxS	PFAS by ID	0.51	J	ng/L	27
011	MW-18-105_021723	Aqueous	PFOS	PFAS by ID	6.2		ng/L	27

(102 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-001**

Description: **MW-18-98_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1400** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1557	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.1**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.76**	**J**	**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.8**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**140**		**3.7**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		149	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20004-001**
Description: **MW-18-98_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023 1400**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-002**

Description: **MW-18-90_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1450** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1607	ALM	02/23/2023 1749	68044
2	SOP SPE	PFAS by ID SOP	5	02/27/2023 1251	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	**335-77-3**	**PFAS by ID SOP**	**0.89**	**J**	**3.5**	**0.68**	**ng/L**	**1**
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**18**		**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.86**	**J**	**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**17**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.8**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**880**		**18**	**8.8**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	272	25-150	N	212	25-150
13C2_6:2FTS	N	204	25-150		129	25-150
13C2_8:2FTS	N	210	25-150		142	25-150
13C2_PFDoA		106	25-150		118	25-150
13C2_PFTeDA		92	25-150		122	25-150
13C3_PFBS		86	25-150		98	25-150
13C3_PFHxS		96	25-150		100	25-150
13C3-HFPO-DA		70	25-150		86	25-150
13C4_PFBA		44	25-150		58	25-150
13C4_PFHpA		99	25-150		110	25-150
13C5_PFHxA		95	25-150		99	25-150
13C5_PFPeA		78	25-150		102	25-150
13C6_PFDA		115	25-150		124	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-002**

Description: **MW-18-90_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1450** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		109	25-150		104	25-150
13C8_PFOA		97	25-150		100	25-150
13C8_PFOS		93	25-150		103	25-150
13C8_PFOSA		94	10-150		98	10-150
13C9_PFNA		102	25-150		96	25-150
d5-EtFOSAA		117	25-150		127	25-150
d3-MeFOSAA		113	25-150		116	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-003**

Description: **DUP-03_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1618	ALM	02/23/2023 1749	68044
2	SOP SPE	PFAS by ID SOP	5	02/27/2023 1302	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	**335-77-3**	**PFAS by ID SOP**	**0.76**	**J**	**3.4**	**0.67**	**ng/L**	**1**
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**17**		**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.71**	**J**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**19**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.1**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**15**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**830**		**17**	**8.6**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	269	25-150	N	191	25-150
13C2_6:2FTS	N	195	25-150		121	25-150
13C2_8:2FTS	N	222	25-150		137	25-150
13C2_PFDoA		114	25-150		102	25-150
13C2_PFTeDA		95	25-150		112	25-150
13C3_PFBS		90	25-150		102	25-150
13C3_PFHxS		98	25-150		100	25-150
13C3-HFPO-DA		70	25-150		91	25-150
13C4_PFBA		44	25-150		58	25-150
13C4_PFHpA		96	25-150		100	25-150
13C5_PFHxA		93	25-150		103	25-150
13C5_PFPeA		82	25-150		99	25-150
13C6_PFDA		112	25-150		118	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-003**

Description: **DUP-03_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		116	25-150		105	25-150
13C8_PFOA		102	25-150		103	25-150
13C8_PFOS		99	25-150		110	25-150
13C8_PFOSA		98	10-150		100	10-150
13C9_PFNA		107	25-150		105	25-150
d5-EtFOSAA		126	25-150		114	25-150
d3-MeFOSAA		118	25-150		108	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-004**

Description: **MW-18-88_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1540** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1629	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.0**	**J**	**3.6**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.60**	**J**	**3.6**	**0.53**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.4**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.8**		**3.6**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.54**	**J**	**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.72**	**J**	**3.6**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.1**		**3.6**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.60**	**J**	**3.6**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**150**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	188	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		74	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20004-004**
Description: **MW-18-88_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023 1540**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-005**

Description: **MW-18-99_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1630** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1640	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.67**	**J**	**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.7**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.85**	**J**	**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.9**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.8**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**56**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	201	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		82	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-005**

Description: **MW-18-99_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1630** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-006**

Description: **MW-18-89_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 0910** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1651	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.0**	**J**	**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.68**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.2**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.94**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.1**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**11**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**120**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	253	25-150
13C2_6:2FTS	N	167	25-150
13C2_8:2FTS		120	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20004-006**
Description: **MW-18-89_021723**		Matrix: **Aqueous**
Date Sampled: **02/17/2023 0910**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-007**

Description: **MW-18-91_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 0945** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/24/2023 1702	ALM	02/23/2023 1749	68044

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.6	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.6	0.63	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.6	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.6	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.6	0.83	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.6	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.6	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.6	0.72	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.6	0.89	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.8	0.40	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	**335-77-3**	**PFAS by ID SOP**	**1.1**	**J**	**3.8**	**0.74**	**ng/L**	**1**
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.68	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.8**	**0.53**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.8**	**0.57**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.79**	**J**	**3.8**	**0.50**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.3**	**J**	**3.8**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.8**	**0.66**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.8**	**0.44**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**7.2**		**3.8**	**0.79**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.8	0.52	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**44**		**3.8**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	261	25-150
13C2_6:2FTS	N	219	25-150
13C2_8:2FTS	N	241	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		52	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		112	25-150
13C7_PFUdA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-007**

Description: **MW-18-91_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 0945** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		128	25-150
d3-MeFOSAA		122	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-008**

Description: **MW-18-95_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 1030** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/03/2023 1450	ALM	02/28/2023 1201	68690

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.5**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.62**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.68**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**29**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	251	25-150
13C2_6:2FTS	N	257	25-150
13C2_8:2FTS	N	215	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		41	25-150
13C4_PFHpA		70	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20004-008**
Description: **MW-18-95_021723**		Matrix: **Aqueous**
Date Sampled: **02/17/2023 1030**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	25-150
13C8_PFOS		88	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		116	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-009**

Description: **UNK-15_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 1120** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/08/2023 0303	ARC2	02/22/2023 1151	68189
2	SOP SPE	PFAS by ID SOP	5	03/08/2023 1440	ALM	02/22/2023 1151	68189

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**13**		**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**3.1**	**J**	**3.4**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.3**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**11**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.0**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**30**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**10**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1100**		**17**	**8.4**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	174	25-150	N	171	25-150
13C2_6:2FTS	N	173	25-150		127	25-150
13C2_8:2FTS		139	25-150		97	25-150
13C2_PFDoA		92	25-150		117	25-150
13C2_PFTeDA		88	25-150		119	25-150
13C3_PFBS		76	25-150		107	25-150
13C3_PFHxS		83	25-150		113	25-150
13C3-HFPO-DA		73	25-150		104	25-150
13C4_PFBA		55	25-150		116	25-150
13C4_PFHpA		91	25-150		118	25-150
13C5_PFHxA		84	25-150		120	25-150
13C5_PFPeA		64	25-150		119	25-150
13C6_PFDA		99	25-150		117	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-009**

Description: **UNK-15_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 1120** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		103	25-150		124	25-150
13C8_PFOA		93	25-150		114	25-150
13C8_PFOS		86	25-150		139	25-150
13C8_PFOSA		94	10-150		127	10-150
13C9_PFNA		93	25-150		119	25-150
d5-EtFOSAA		96	25-150		109	25-150
d3-MeFOSAA		96	25-150		119	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-010**

Description: **MW-18-103_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 1245** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/08/2023 0314	ARC2	02/22/2023 1151	68189

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**15**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**14**		**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**100**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.53**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.8**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.5**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.5**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		65	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB20004-010**
Description: **MW-18-103_021723**
Matrix: **Aqueous**
Date Sampled: **02/17/2023 1245**
Project Name: **RACER Lansing**
Date Received: **02/18/2023**
Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20004-011**

Description: **MW-18-105_021723** Matrix: **Aqueous**

Date Sampled: **02/17/2023 1335** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/08/2023 0325	ARC2	02/22/2023 1151	68189

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.51**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**6.2**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		65	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20004-011**
Description: **MW-18-105_021723**		Matrix: **Aqueous**
Date Sampled: **02/17/2023 1335**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ68044-001
Batch: 68044
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/23/2023 1749

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	02/24/2023 1302
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	02/24/2023 1302
8:2 FTS	ND		1	8.0	1.6	ng/L	02/24/2023 1302
6:2 FTS	ND		1	8.0	2.0	ng/L	02/24/2023 1302
4:2 FTS	ND		1	8.0	0.87	ng/L	02/24/2023 1302
GenX	ND		1	8.0	2.1	ng/L	02/24/2023 1302
ADONA	ND		1	8.0	0.48	ng/L	02/24/2023 1302
EtFOSAA	ND		1	8.0	0.75	ng/L	02/24/2023 1302
MeFOSAA	ND		1	8.0	0.93	ng/L	02/24/2023 1302
PFBS	ND		1	4.0	0.41	ng/L	02/24/2023 1302
PFDS	ND		1	4.0	0.78	ng/L	02/24/2023 1302
PFHpS	ND		1	4.0	0.50	ng/L	02/24/2023 1302
PFNS	ND		1	4.0	0.71	ng/L	02/24/2023 1302
PFOSA	ND		1	4.0	0.61	ng/L	02/24/2023 1302
PFPeS	ND		1	4.0	0.59	ng/L	02/24/2023 1302
PFHxS	ND		1	4.0	0.55	ng/L	02/24/2023 1302
PFBA	ND		1	4.0	0.60	ng/L	02/24/2023 1302
PFDA	ND		1	4.0	0.52	ng/L	02/24/2023 1302
PFDoA	ND		1	4.0	0.47	ng/L	02/24/2023 1302
PFHpA	ND		1	4.0	0.45	ng/L	02/24/2023 1302
PFHxA	ND		1	4.0	0.69	ng/L	02/24/2023 1302
PFNA	ND		1	4.0	0.46	ng/L	02/24/2023 1302
PFOA	ND		1	4.0	0.83	ng/L	02/24/2023 1302
PFPeA	ND		1	4.0	0.54	ng/L	02/24/2023 1302
PFTeDA	ND		1	4.0	0.60	ng/L	02/24/2023 1302
PFTrDA	ND		1	4.0	0.53	ng/L	02/24/2023 1302
PFUdA	ND		1	4.0	0.63	ng/L	02/24/2023 1302
PFOS	ND		1	4.0	2.0	ng/L	02/24/2023 1302

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	25-150
13C2_6:2FTS		78	25-150
13C2_8:2FTS		88	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68044-001
Batch: 68044
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/23/2023 1749

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		91	25-150
13C8_PFOS		88	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68044-002
Batch: 68044
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/23/2023 1749

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	50-150	02/24/2023 1313
11Cl-PF3OUdS	15	15		1	102	50-150	02/24/2023 1313
8:2 FTS	15	18		1	117	50-150	02/24/2023 1313
6:2 FTS	15	17		1	110	50-150	02/24/2023 1313
4:2 FTS	15	19		1	130	50-150	02/24/2023 1313
GenX	32	36		1	111	50-150	02/24/2023 1313
ADONA	15	16		1	108	50-150	02/24/2023 1313
EtFOSAA	16	17		1	106	50-150	02/24/2023 1313
MeFOSAA	16	17		1	107	50-150	02/24/2023 1313
PFBS	14	15		1	106	50-150	02/24/2023 1313
PFDS	15	16		1	101	50-150	02/24/2023 1313
PFHpS	15	16		1	103	50-150	02/24/2023 1313
PFNS	15	17		1	108	50-150	02/24/2023 1313
PFOSA	16	18		1	113	50-150	02/24/2023 1313
PFPeS	15	16		1	110	50-150	02/24/2023 1313
PFHxS	15	15		1	106	50-150	02/24/2023 1313
PFBA	16	17		1	104	50-150	02/24/2023 1313
PFDA	16	16		1	98	50-150	02/24/2023 1313
PFDoA	16	18		1	112	50-150	02/24/2023 1313
PFHpA	16	16		1	102	50-150	02/24/2023 1313
PFHxA	16	16		1	100	50-150	02/24/2023 1313
PFNA	16	17		1	109	50-150	02/24/2023 1313
PFOA	16	18		1	112	50-150	02/24/2023 1313
PFPeA	16	18		1	110	50-150	02/24/2023 1313
PFTeDA	16	17		1	103	50-150	02/24/2023 1313
PFTrDA	16	15		1	92	50-150	02/24/2023 1313
PFUdA	16	16		1	99	50-150	02/24/2023 1313
PFOS	15	15		1	103	50-150	02/24/2023 1313

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68044-002
Batch: 68044
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/23/2023 1749

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		87	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68189-001
Batch: 68189
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	03/08/2023 0241
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	03/08/2023 0241
8:2 FTS	ND		1	8.0	1.6	ng/L	03/08/2023 0241
6:2 FTS	ND		1	8.0	2.0	ng/L	03/08/2023 0241
4:2 FTS	ND		1	8.0	0.87	ng/L	03/08/2023 0241
GenX	ND		1	8.0	2.1	ng/L	03/08/2023 0241
ADONA	ND		1	8.0	0.48	ng/L	03/08/2023 0241
EtFOSAA	ND		1	8.0	0.75	ng/L	03/08/2023 0241
MeFOSAA	ND		1	8.0	0.93	ng/L	03/08/2023 0241
PFBS	ND		1	4.0	0.41	ng/L	03/08/2023 0241
PFDS	ND		1	4.0	0.78	ng/L	03/08/2023 0241
PFHpS	ND		1	4.0	0.50	ng/L	03/08/2023 0241
PFNS	ND		1	4.0	0.71	ng/L	03/08/2023 0241
PFOSA	ND		1	4.0	0.61	ng/L	03/08/2023 0241
PFPeS	ND		1	4.0	0.59	ng/L	03/08/2023 0241
PFHxS	ND		1	4.0	0.55	ng/L	03/08/2023 0241
PFBA	ND		1	4.0	0.60	ng/L	03/08/2023 0241
PFDA	ND		1	4.0	0.52	ng/L	03/08/2023 0241
PFDoA	ND		1	4.0	0.47	ng/L	03/08/2023 0241
PFHpA	ND		1	4.0	0.45	ng/L	03/08/2023 0241
PFHxA	ND		1	4.0	0.69	ng/L	03/08/2023 0241
PFNA	ND		1	4.0	0.46	ng/L	03/08/2023 0241
PFOA	ND		1	4.0	0.83	ng/L	03/08/2023 0241
PFPeA	ND		1	4.0	0.54	ng/L	03/08/2023 0241
PFTeDA	ND		1	4.0	0.60	ng/L	03/08/2023 0241
PFTrDA	ND		1	4.0	0.53	ng/L	03/08/2023 0241
PFUdA	ND		1	4.0	0.63	ng/L	03/08/2023 0241
PFOS	ND		1	4.0	2.0	ng/L	03/08/2023 0241

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68189-001
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		96	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68189-002
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	03/08/2023 0252
11Cl-PF3OUdS	15	15		1	100	50-150	03/08/2023 0252
8:2 FTS	15	20		1	130	50-150	03/08/2023 0252
6:2 FTS	15	17		1	113	50-150	03/08/2023 0252
4:2 FTS	15	17		1	114	50-150	03/08/2023 0252
GenX	32	39		1	121	50-150	03/08/2023 0252
ADONA	15	17		1	111	50-150	03/08/2023 0252
EtFOSAA	16	17		1	105	50-150	03/08/2023 0252
MeFOSAA	16	16		1	103	50-150	03/08/2023 0252
PFBS	14	15		1	108	50-150	03/08/2023 0252
PFDS	15	16		1	105	50-150	03/08/2023 0252
PFHpS	15	19		1	123	50-150	03/08/2023 0252
PFNS	15	17		1	108	50-150	03/08/2023 0252
PFOSA	16	17		1	109	50-150	03/08/2023 0252
PFPeS	15	16		1	104	50-150	03/08/2023 0252
PFHxS	15	17		1	114	50-150	03/08/2023 0252
PFBA	16	17		1	104	50-150	03/08/2023 0252
PFDA	16	16		1	101	50-150	03/08/2023 0252
PFDoA	16	17		1	108	50-150	03/08/2023 0252
PFHpA	16	16		1	100	50-150	03/08/2023 0252
PFHxA	16	16		1	100	50-150	03/08/2023 0252
PFNA	16	17		1	106	50-150	03/08/2023 0252
PFOA	16	17		1	108	50-150	03/08/2023 0252
PFPeA	16	17		1	104	50-150	03/08/2023 0252
PFTeDA	16	16		1	103	50-150	03/08/2023 0252
PFTrDA	16	15		1	94	50-150	03/08/2023 0252
PFUdA	16	15		1	97	50-150	03/08/2023 0252
PFOS	15	16		1	105	50-150	03/08/2023 0252

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68189-002
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		92	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68690-001
Batch: 68690
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/28/2023 1201

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	03/03/2023 1333
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	03/03/2023 1333
8:2 FTS	ND		1	8.0	1.6	ng/L	03/03/2023 1333
6:2 FTS	ND		1	8.0	2.0	ng/L	03/03/2023 1333
4:2 FTS	ND		1	8.0	0.87	ng/L	03/03/2023 1333
GenX	ND		1	8.0	2.1	ng/L	03/03/2023 1333
ADONA	ND		1	8.0	0.48	ng/L	03/03/2023 1333
EtFOSAA	ND		1	8.0	0.75	ng/L	03/03/2023 1333
MeFOSAA	ND		1	8.0	0.93	ng/L	03/03/2023 1333
PFBS	ND		1	4.0	0.41	ng/L	03/03/2023 1333
PFDS	ND		1	4.0	0.78	ng/L	03/03/2023 1333
PFHpS	ND		1	4.0	0.50	ng/L	03/03/2023 1333
PFNS	ND		1	4.0	0.71	ng/L	03/03/2023 1333
PFOSA	ND		1	4.0	0.61	ng/L	03/03/2023 1333
PFPeS	ND		1	4.0	0.59	ng/L	03/03/2023 1333
PFHxS	ND		1	4.0	0.55	ng/L	03/03/2023 1333
PFBA	ND		1	4.0	0.60	ng/L	03/03/2023 1333
PFDA	ND		1	4.0	0.52	ng/L	03/03/2023 1333
PFDoA	ND		1	4.0	0.47	ng/L	03/03/2023 1333
PFHpA	ND		1	4.0	0.45	ng/L	03/03/2023 1333
PFHxA	ND		1	4.0	0.69	ng/L	03/03/2023 1333
PFNA	ND		1	4.0	0.46	ng/L	03/03/2023 1333
PFOA	ND		1	4.0	0.83	ng/L	03/03/2023 1333
PFPeA	ND		1	4.0	0.54	ng/L	03/03/2023 1333
PFTeDA	ND		1	4.0	0.60	ng/L	03/03/2023 1333
PFTrDA	ND		1	4.0	0.53	ng/L	03/03/2023 1333
PFUdA	ND		1	4.0	0.63	ng/L	03/03/2023 1333
PFOS	ND		1	4.0	2.0	ng/L	03/03/2023 1333

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68690-001
Batch: 68690
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/28/2023 1201

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		97	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68690-002
Batch: 68690
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/28/2023 1201

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	102	50-150	03/03/2023 1344
11Cl-PF3OUdS	15	14		1	93	50-150	03/03/2023 1344
8:2 FTS	15	17		1	110	50-150	03/03/2023 1344
6:2 FTS	15	14		1	92	50-150	03/03/2023 1344
4:2 FTS	15	16		1	105	50-150	03/03/2023 1344
GenX	32	33		1	102	50-150	03/03/2023 1344
ADONA	15	15		1	103	50-150	03/03/2023 1344
EtFOSAA	16	16		1	102	50-150	03/03/2023 1344
MeFOSAA	16	15		1	95	50-150	03/03/2023 1344
PFBS	14	13		1	95	50-150	03/03/2023 1344
PFDS	15	13		1	84	50-150	03/03/2023 1344
PFHpS	15	14		1	94	50-150	03/03/2023 1344
PFNS	15	15		1	98	50-150	03/03/2023 1344
PFOSA	16	16		1	98	50-150	03/03/2023 1344
PFPeS	15	14		1	96	50-150	03/03/2023 1344
PFHxS	15	13		1	91	50-150	03/03/2023 1344
PFBA	16	15		1	91	50-150	03/03/2023 1344
PFDA	16	14		1	88	50-150	03/03/2023 1344
PFDoA	16	15		1	95	50-150	03/03/2023 1344
PFHpA	16	13		1	83	50-150	03/03/2023 1344
PFHxA	16	15		1	96	50-150	03/03/2023 1344
PFNA	16	14		1	87	50-150	03/03/2023 1344
PFOA	16	15		1	93	50-150	03/03/2023 1344
PFPeA	16	15		1	92	50-150	03/03/2023 1344
PFTeDA	16	14		1	88	50-150	03/03/2023 1344
PFTrDA	16	13		1	84	50-150	03/03/2023 1344
PFUdA	16	15		1	92	50-150	03/03/2023 1344
PFOS	15	14		1	97	50-150	03/03/2023 1344

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		119	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		94	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		101	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68690-002
Batch: 68690
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/28/2023 1201

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		97	25-150
13C8_PFOA		102	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical

Plant 3

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 146138

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 947-777-5215 kaitlin.Hunt@arcadis.com
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x	Quote No.
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis	Page 1 of 2
Project Name: BACER Landfill		YB20004
Project No.: 30112592.0370A	P.O. No.	Remarks / Cooler I.D.

Analysis (Attach list if more space is needed): PFAS method 537 mod w/isotope dilution (PFAS 24)

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Composite (C) / Grab (G)	Matrix: Aqueous	Soil	Other (Specify)	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Ascorbic Acid	Filter (Filtered)	PFAS
MW-18-98_021623	2/16/23	1400	G	X			2							X
MW-18-90_021623	2/16/23	1450	G	X			2							X
DUP-03_021623	2/16/23	———	G	X			2							X
MW-18-88_021623	2/16/23	1540	G	X			2							X
MW-18-99_021623	2/16/23	1630	G	X			2							X
MW-18-89_021723	2/17/23	0910	G	X			2							X
MW-18-91_021723	2/17/23	0945	G	X			2							X
MW-18-95_021723	2/17/23	1030	G	X			2							X
UNK-15_021723	2/17/23	1120	G	X			2							X
MW-18-103_021723	2/17/23	1245	G	X			2							X

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis / Arcadis	2/17/23	1530	1. Received by: FedEx		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	02/18/23	1135	4. Laboratory received by: Thalia N Roberts	02/18/23	1135

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No Ice Pack — Receipt Temp: 1.9 °C — Temp Blank: ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME002NB-01

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www.pacelabs.com

Number 146138

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 947-777-5215
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x	Analysis (Attach list if more space is needed)
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis	
Project Name: RACER Lansing		
Project No.: 30112892.03704	P.O. No.	

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	# of Grab Containers	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	SDS W	Field Filtered	PFAS Method 537.1 rev 1.1 Isotope Dilution List
MW-18-105_021723	2/17/23	1335	G	X			2							X

Sample Lot #: YB20004
KES2
Remarks / Cooler I.D.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis/Arcadis	2/17/23	1530	1. Received by: Fed Ex		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	02/18/23	1135	4. Laboratory received by: Kayla N Roberts	02/18/23	1135

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack
Receipt Temp. 1.9 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MEG0SN9-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: KNR / 02/16/2023 Lot #: YB20004

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:			
☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID:

1.9 / 1.9 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # _____. Time of preservation _____. If more than one preservative is needed, please note in the comments below.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER Lansing

Project Number: 30171056.0370A

Lot Number:**YB20006**

Date Completed:03/09/2023

Kathy Smith

03/09/2023 5:16 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

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Case Narrative
Arcadis U.S., Inc.
Lot Number: YB20006

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
The MS/MSD associated with sample YB20006-005 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample YB20006-005 had surrogates recovered outside of the acceptance limits due to confirmed matrix interference.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YB20006

Project Name: RACER Lansing

Project Number: 30171056.0370A

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-21-140_021623	Aqueous	02/16/2023 0920	02/18/2023
002	MW-16-78_021623	Aqueous	02/16/2023 1120	02/18/2023
003	DUP-02_021623	Aqueous	02/16/2023	02/18/2023
004	EB-02_021623	Aqueous	02/16/2023 1645	02/18/2023
005	MW-21-139_021523	Aqueous	02/15/2023 1555	02/18/2023

(5 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YB20006

Project Name: RACER Lansing

Project Number: 30171056.0370A

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	MW-16-78_021623	Aqueous	PFBA	PFAS by ID	3.2	J	ng/L	7
002	MW-16-78_021623	Aqueous	PFPeA	PFAS by ID	1.9	J	ng/L	7
003	DUP-02_021623	Aqueous	PFBA	PFAS by ID	2.8	J	ng/L	9
003	DUP-02_021623	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	9
005	MW-21-139_021523	Aqueous	8:2 FTS	PFAS by ID	32		ng/L	13
005	MW-21-139_021523	Aqueous	6:2 FTS	PFAS by ID	46	S	ng/L	13
005	MW-21-139_021523	Aqueous	PFBS	PFAS by ID	31		ng/L	13
005	MW-21-139_021523	Aqueous	PFHpS	PFAS by ID	20		ng/L	13
005	MW-21-139_021523	Aqueous	PFPeS	PFAS by ID	36		ng/L	13
005	MW-21-139_021523	Aqueous	PFHxS	PFAS by ID	260	S	ng/L	13
005	MW-21-139_021523	Aqueous	PFBA	PFAS by ID	40		ng/L	13
005	MW-21-139_021523	Aqueous	PFDA	PFAS by ID	4.1		ng/L	13
005	MW-21-139_021523	Aqueous	PFHpA	PFAS by ID	56		ng/L	13
005	MW-21-139_021523	Aqueous	PFHxA	PFAS by ID	99		ng/L	13
005	MW-21-139_021523	Aqueous	PFNA	PFAS by ID	15		ng/L	13
005	MW-21-139_021523	Aqueous	PFOA	PFAS by ID	79		ng/L	13
005	MW-21-139_021523	Aqueous	PFPeA	PFAS by ID	94		ng/L	13
005	MW-21-139_021523	Aqueous	PFOS	PFAS by ID	1000		ng/L	13

(18 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-001**

Description: **MW-21-140_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 0920** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/08/2023 0336	ARC2	02/22/2023 1151	68189

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20006-001**
Description: **MW-21-140_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023 0920**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-002**

Description: **MW-16-78_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1120** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	03/08/2023 0408	ARC2	02/22/2023 1151	68189

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.9**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20006-002**
Description: **MW-16-78_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023 1120**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		74	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-003**

Description: **DUP-02_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/23/2023 1713	OMNS	02/22/2023 1719	68230

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.7**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20006-003**
Description: **DUP-02_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-004**

Description: **EB-02_021623** Matrix: **Aqueous**

Date Sampled: **02/16/2023 1645** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/23/2023 1735	OMNS	02/22/2023 1719	68230

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	25-150
13C2_6:2FTS		91	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		104	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		103	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		98	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YB20006-004**
Description: **EB-02_021623**		Matrix: **Aqueous**
Date Sampled: **02/16/2023 1645**	Project Name: **RACER Lansing**	
Date Received: **02/18/2023**	Project Number: **30171056.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-005**

Description: **MW-21-139_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1555** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	02/23/2023 1746	OMNS	02/22/2023 1719	68230
2	SOP SPE	PFAS by ID SOP	5	02/24/2023 1251	ALM	02/22/2023 1719	68230

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**32**		**6.9**	**1.4**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**46**	**S**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**31**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**20**		**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**36**		**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**260**	**S**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**40**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**56**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**99**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**15**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**79**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**94**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1000**		**17**	**8.6**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	217	25-150		128	25-150
13C2_6:2FTS		127	25-150		96	25-150
13C2_8:2FTS		149	25-150		120	25-150
13C2_PFDoA		117	25-150		98	25-150
13C2_PFTeDA		92	25-150		93	25-150
13C3_PFBS		98	25-150		104	25-150
13C3_PFHxS		95	25-150		110	25-150
13C3-HFPO-DA		82	25-150		90	25-150
13C4_PFBA		74	25-150		110	25-150
13C4_PFHpA		103	25-150		104	25-150
13C5_PFHxA		108	25-150		108	25-150
13C5_PFPeA		92	25-150		102	25-150
13C6_PFDA		114	25-150		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB20006-005**

Description: **MW-21-139_021523** Matrix: **Aqueous**

Date Sampled: **02/15/2023 1555** Project Name: **RACER Lansing**

Date Received: **02/18/2023** Project Number: **30171056.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		106	25-150		95	25-150
13C8_PFOA		102	25-150		98	25-150
13C8_PFOS		107	25-150		107	25-150
13C8_PFOSA		95	10-150		99	10-150
13C9_PFNA		108	25-150		102	25-150
d5-EtFOSAA		95	25-150		95	25-150
d3-MeFOSAA		115	25-150		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ68189-001
Batch: 68189
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	03/08/2023 0241
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	03/08/2023 0241
8:2 FTS	ND		1	8.0	1.6	ng/L	03/08/2023 0241
6:2 FTS	ND		1	8.0	2.0	ng/L	03/08/2023 0241
4:2 FTS	ND		1	8.0	0.87	ng/L	03/08/2023 0241
GenX	ND		1	8.0	2.1	ng/L	03/08/2023 0241
ADONA	ND		1	8.0	0.48	ng/L	03/08/2023 0241
EtFOSAA	ND		1	8.0	0.75	ng/L	03/08/2023 0241
MeFOSAA	ND		1	8.0	0.93	ng/L	03/08/2023 0241
PFBS	ND		1	4.0	0.41	ng/L	03/08/2023 0241
PFDS	ND		1	4.0	0.78	ng/L	03/08/2023 0241
PFHpS	ND		1	4.0	0.50	ng/L	03/08/2023 0241
PFNS	ND		1	4.0	0.71	ng/L	03/08/2023 0241
PFOSA	ND		1	4.0	0.61	ng/L	03/08/2023 0241
PFPeS	ND		1	4.0	0.59	ng/L	03/08/2023 0241
PFHxS	ND		1	4.0	0.55	ng/L	03/08/2023 0241
PFBA	ND		1	4.0	0.60	ng/L	03/08/2023 0241
PFDA	ND		1	4.0	0.52	ng/L	03/08/2023 0241
PFDoA	ND		1	4.0	0.47	ng/L	03/08/2023 0241
PFHpA	ND		1	4.0	0.45	ng/L	03/08/2023 0241
PFHxA	ND		1	4.0	0.69	ng/L	03/08/2023 0241
PFNA	ND		1	4.0	0.46	ng/L	03/08/2023 0241
PFOA	ND		1	4.0	0.83	ng/L	03/08/2023 0241
PFPeA	ND		1	4.0	0.54	ng/L	03/08/2023 0241
PFTeDA	ND		1	4.0	0.60	ng/L	03/08/2023 0241
PFTrDA	ND		1	4.0	0.53	ng/L	03/08/2023 0241
PFUdA	ND		1	4.0	0.63	ng/L	03/08/2023 0241
PFOS	ND		1	4.0	2.0	ng/L	03/08/2023 0241

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68189-001
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		96	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68189-002
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	03/08/2023 0252
11Cl-PF3OUdS	15	15		1	100	50-150	03/08/2023 0252
8:2 FTS	15	20		1	130	50-150	03/08/2023 0252
6:2 FTS	15	17		1	113	50-150	03/08/2023 0252
4:2 FTS	15	17		1	114	50-150	03/08/2023 0252
GenX	32	39		1	121	50-150	03/08/2023 0252
ADONA	15	17		1	111	50-150	03/08/2023 0252
EtFOSAA	16	17		1	105	50-150	03/08/2023 0252
MeFOSAA	16	16		1	103	50-150	03/08/2023 0252
PFBS	14	15		1	108	50-150	03/08/2023 0252
PFDS	15	16		1	105	50-150	03/08/2023 0252
PFHpS	15	19		1	123	50-150	03/08/2023 0252
PFNS	15	17		1	108	50-150	03/08/2023 0252
PFOSA	16	17		1	109	50-150	03/08/2023 0252
PFPeS	15	16		1	104	50-150	03/08/2023 0252
PFHxS	15	17		1	114	50-150	03/08/2023 0252
PFBA	16	17		1	104	50-150	03/08/2023 0252
PFDA	16	16		1	101	50-150	03/08/2023 0252
PFDoA	16	17		1	108	50-150	03/08/2023 0252
PFHpA	16	16		1	100	50-150	03/08/2023 0252
PFHxA	16	16		1	100	50-150	03/08/2023 0252
PFNA	16	17		1	106	50-150	03/08/2023 0252
PFOA	16	17		1	108	50-150	03/08/2023 0252
PFPeA	16	17		1	104	50-150	03/08/2023 0252
PFTeDA	16	16		1	103	50-150	03/08/2023 0252
PFTrDA	16	15		1	94	50-150	03/08/2023 0252
PFUdA	16	15		1	97	50-150	03/08/2023 0252
PFOS	15	16		1	105	50-150	03/08/2023 0252

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68189-002
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		92	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB20006-001MS
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	104	50-150	03/08/2023 0347
11Cl-PF3OUdS	ND	13	13		1	100	50-150	03/08/2023 0347
8:2 FTS	ND	13	16		1	120	50-150	03/08/2023 0347
6:2 FTS	ND	13	14		1	104	50-150	03/08/2023 0347
4:2 FTS	ND	13	16		1	127	50-150	03/08/2023 0347
GenX	ND	28	33		1	117	50-150	03/08/2023 0347
ADONA	ND	13	15		1	116	50-150	03/08/2023 0347
EtFOSAA	ND	14	14		1	104	50-150	03/08/2023 0347
MeFOSAA	ND	14	14		1	102	50-150	03/08/2023 0347
PFBS	ND	12	13		1	106	50-150	03/08/2023 0347
PFDS	ND	13	15		1	112	50-150	03/08/2023 0347
PFHpS	ND	13	16		1	118	50-150	03/08/2023 0347
PFNS	ND	13	14		1	108	50-150	03/08/2023 0347
PFOSA	ND	14	16		1	112	50-150	03/08/2023 0347
PFPeS	ND	13	13		1	103	50-150	03/08/2023 0347
PFHxS	ND	13	14		1	107	50-150	03/08/2023 0347
PFBA	ND	14	15		1	106	50-150	03/08/2023 0347
PFDA	ND	14	14		1	103	50-150	03/08/2023 0347
PFDoA	ND	14	16		1	118	50-150	03/08/2023 0347
PFHpA	ND	14	15		1	107	50-150	03/08/2023 0347
PFHxA	ND	14	14		1	101	50-150	03/08/2023 0347
PFNA	ND	14	15		1	107	50-150	03/08/2023 0347
PFOA	ND	14	15		1	107	50-150	03/08/2023 0347
PFPeA	ND	14	14		1	99	50-150	03/08/2023 0347
PFTeDA	ND	14	14		1	103	50-150	03/08/2023 0347
PFTrDA	ND	14	14		1	99	50-150	03/08/2023 0347
PFUdA	ND	14	13		1	95	50-150	03/08/2023 0347
PFOS	ND	13	14		1	110	50-150	03/08/2023 0347

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		83	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		94	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB20006-001MS
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		92	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB20006-001MD
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	104	0.61	50-150	30	03/08/2023 0358
11Cl-PF3OUdS	ND	13	13		1	103	2.8	50-150	30	03/08/2023 0358
8:2 FTS	ND	13	19		1	142	16	50-150	30	03/08/2023 0358
6:2 FTS	ND	13	16		1	121	14	50-150	30	03/08/2023 0358
4:2 FTS	ND	13	18		1	142	11	50-150	30	03/08/2023 0358
GenX	ND	28	34		1	123	4.3	50-150	30	03/08/2023 0358
ADONA	ND	13	14		1	112	4.2	50-150	30	03/08/2023 0358
EtFOSAA	ND	14	16		1	115	9.3	50-150	30	03/08/2023 0358
MeFOSAA	ND	14	15		1	107	4.1	50-150	30	03/08/2023 0358
PFBS	ND	12	13		1	111	3.4	50-150	30	03/08/2023 0358
PFDS	ND	13	14		1	103	8.3	50-150	30	03/08/2023 0358
PFHpS	ND	13	15		1	113	4.8	50-150	30	03/08/2023 0358
PFNS	ND	13	14		1	106	2.0	50-150	30	03/08/2023 0358
PFOSA	ND	14	17		1	121	6.6	50-150	30	03/08/2023 0358
PFPeS	ND	13	13		1	102	1.4	50-150	30	03/08/2023 0358
PFHxS	ND	13	14		1	112	4.0	50-150	30	03/08/2023 0358
PFBA	ND	14	15		1	111	4.3	50-150	30	03/08/2023 0358
PFDA	ND	14	16		1	113	9.2	50-150	30	03/08/2023 0358
PFDoA	ND	14	16		1	118	0.44	50-150	30	03/08/2023 0358
PFHpA	ND	14	15		1	107	0.97	50-150	30	03/08/2023 0358
PFHxA	ND	14	16		1	114	12	50-150	30	03/08/2023 0358
PFNA	ND	14	16		1	113	5.3	50-150	30	03/08/2023 0358
PFOA	ND	14	16		1	115	6.3	50-150	30	03/08/2023 0358
PFPeA	ND	14	15		1	111	11	50-150	30	03/08/2023 0358
PFTeDA	ND	14	15		1	110	6.3	50-150	30	03/08/2023 0358
PFTrDA	ND	14	15		1	108	8.9	50-150	30	03/08/2023 0358
PFUdA	ND	14	15		1	108	13	50-150	30	03/08/2023 0358
PFOS	ND	13	15		1	116	4.9	50-150	30	03/08/2023 0358

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB20006-001MD
Batch: 68189
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1151

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		89	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68230-001
Batch: 68230
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	02/23/2023 1607
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	02/23/2023 1607
8:2 FTS	ND		1	8.0	1.6	ng/L	02/23/2023 1607
6:2 FTS	ND		1	8.0	2.0	ng/L	02/23/2023 1607
4:2 FTS	ND		1	8.0	0.87	ng/L	02/23/2023 1607
GenX	ND		1	8.0	2.1	ng/L	02/23/2023 1607
ADONA	ND		1	8.0	0.48	ng/L	02/23/2023 1607
EtFOSAA	ND		1	8.0	0.75	ng/L	02/23/2023 1607
MeFOSAA	ND		1	8.0	0.93	ng/L	02/23/2023 1607
PFBS	ND		1	4.0	0.41	ng/L	02/23/2023 1607
PFDS	ND		1	4.0	0.78	ng/L	02/23/2023 1607
PFHpS	ND		1	4.0	0.50	ng/L	02/23/2023 1607
PFNS	ND		1	4.0	0.71	ng/L	02/23/2023 1607
PFOSA	ND		1	4.0	0.61	ng/L	02/23/2023 1607
PFPeS	ND		1	4.0	0.59	ng/L	02/23/2023 1607
PFHxS	ND		1	4.0	0.55	ng/L	02/23/2023 1607
PFBA	ND		1	4.0	0.60	ng/L	02/23/2023 1607
PFDA	ND		1	4.0	0.52	ng/L	02/23/2023 1607
PFDoA	ND		1	4.0	0.47	ng/L	02/23/2023 1607
PFHpA	ND		1	4.0	0.45	ng/L	02/23/2023 1607
PFHxA	ND		1	4.0	0.69	ng/L	02/23/2023 1607
PFNA	ND		1	4.0	0.46	ng/L	02/23/2023 1607
PFOA	ND		1	4.0	0.83	ng/L	02/23/2023 1607
PFPeA	ND		1	4.0	0.54	ng/L	02/23/2023 1607
PFTeDA	ND		1	4.0	0.60	ng/L	02/23/2023 1607
PFTrDA	ND		1	4.0	0.53	ng/L	02/23/2023 1607
PFUdA	ND		1	4.0	0.63	ng/L	02/23/2023 1607
PFOS	ND		1	4.0	2.0	ng/L	02/23/2023 1607

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	25-150
13C2_6:2FTS		89	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		99	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		101	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ68230-001
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		99	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68230-002
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	96	50-150	02/23/2023 1618
11Cl-PF3OUdS	15	12		1	79	50-150	02/23/2023 1618
8:2 FTS	15	15		1	100	50-150	02/23/2023 1618
6:2 FTS	15	17		1	114	50-150	02/23/2023 1618
4:2 FTS	15	17		1	113	50-150	02/23/2023 1618
GenX	32	36		1	111	50-150	02/23/2023 1618
ADONA	15	15		1	96	50-150	02/23/2023 1618
EtFOSAA	16	18		1	111	50-150	02/23/2023 1618
MeFOSAA	16	16		1	98	50-150	02/23/2023 1618
PFBS	14	14		1	99	50-150	02/23/2023 1618
PFDS	15	13		1	85	50-150	02/23/2023 1618
PFHpS	15	14		1	94	50-150	02/23/2023 1618
PFNS	15	16		1	103	50-150	02/23/2023 1618
PFOSA	16	17		1	108	50-150	02/23/2023 1618
PFPeS	15	15		1	98	50-150	02/23/2023 1618
PFHxS	15	13		1	88	50-150	02/23/2023 1618
PFBA	16	15		1	96	50-150	02/23/2023 1618
PFDA	16	18		1	112	50-150	02/23/2023 1618
PFDoA	16	17		1	104	50-150	02/23/2023 1618
PFHpA	16	17		1	108	50-150	02/23/2023 1618
PFHxA	16	17		1	107	50-150	02/23/2023 1618
PFNA	16	15		1	96	50-150	02/23/2023 1618
PFOA	16	15		1	97	50-150	02/23/2023 1618
PFPeA	16	15		1	96	50-150	02/23/2023 1618
PFTeDA	16	16		1	99	50-150	02/23/2023 1618
PFTrDA	16	11		1	71	50-150	02/23/2023 1618
PFUdA	16	15		1	92	50-150	02/23/2023 1618
PFOS	15	15		1	102	50-150	02/23/2023 1618

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		81	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		61	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		101	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ68230-002
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		100	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YB20006-003DU
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	02/23/2023 1724
11Cl-PF3OUdS	ND	ND		1	0.00	20	02/23/2023 1724
8:2 FTS	ND	ND		1	0.00	20	02/23/2023 1724
6:2 FTS	ND	ND		1	0.00	20	02/23/2023 1724
4:2 FTS	ND	ND		1	0.00	20	02/23/2023 1724
GenX	ND	ND		1	0.00	20	02/23/2023 1724
ADONA	ND	ND		1	0.00	20	02/23/2023 1724
EtFOSAA	ND	ND		1	0.00	20	02/23/2023 1724
MeFOSAA	ND	ND		1	0.00	20	02/23/2023 1724
PFBS	ND	ND		1	0.00	20	02/23/2023 1724
PFDS	ND	ND		1	0.00	20	02/23/2023 1724
PFHpS	ND	ND		1	0.00	20	02/23/2023 1724
PFNS	ND	ND		1	0.00	20	02/23/2023 1724
PFOSA	ND	ND		1	0.00	20	02/23/2023 1724
PFPeS	ND	ND		1	0.00	20	02/23/2023 1724
PFHxS	ND	ND		1	0.00	20	02/23/2023 1724
PFBA	2.8	2.9	J	1	3.8	20	02/23/2023 1724
PFDA	ND	ND		1	0.00	20	02/23/2023 1724
PFDoA	ND	ND		1	0.00	20	02/23/2023 1724
PFHpA	ND	ND		1	0.00	20	02/23/2023 1724
PFHxA	ND	ND		1	0.00	20	02/23/2023 1724
PFNA	ND	ND		1	0.00	20	02/23/2023 1724
PFOA	ND	ND		1	0.00	20	02/23/2023 1724
PFPeA	1.7	1.7	J	1	0.28	20	02/23/2023 1724
PFTeDA	ND	ND		1	0.00	20	02/23/2023 1724
PFTrDA	ND	ND		1	0.00	20	02/23/2023 1724
PFUdA	ND	ND		1	0.00	20	02/23/2023 1724
PFOS	ND	ND		1	0.00	20	02/23/2023 1724

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		111	25-150
13C5_PFPeA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YB20006-003DU
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		102	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		108	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB20006-005MS
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	99	50-150	02/23/2023 1757
11Cl-PF3OUdS	ND	13	12		1	90	50-150	02/23/2023 1757
8:2 FTS	32	13	45		1	100	50-150	02/23/2023 1757
6:2 FTS	46	13	52	N	1	47	50-150	02/23/2023 1757
4:2 FTS	ND	13	15		1	115	50-150	02/23/2023 1757
GenX	ND	27	33		1	121	50-150	02/23/2023 1757
ADONA	ND	13	12		1	97	50-150	02/23/2023 1757
EtFOSAA	ND	14	16		1	114	50-150	02/23/2023 1757
MeFOSAA	ND	14	14		1	100	50-150	02/23/2023 1757
PFBS	31	12	43		1	94	50-150	02/23/2023 1757
PFDS	ND	13	13		1	101	50-150	02/23/2023 1757
PFHpS	20	13	30		1	76	50-150	02/23/2023 1757
PFNS	ND	13	13		1	102	50-150	02/23/2023 1757
PFOSA	ND	14	16		1	114	50-150	02/23/2023 1757
PFPeS	36	13	48		1	97	50-150	02/23/2023 1757
PFHxS	260	12	290	N	1	203	50-150	02/23/2023 1757
PFBA	40	14	54		1	98	50-150	02/23/2023 1757
PFDA	4.1	14	18		1	103	50-150	02/23/2023 1757
PFDoA	ND	14	14		1	105	50-150	02/23/2023 1757
PFHpA	56	14	70		1	101	50-150	02/23/2023 1757
PFHxA	99	14	120		1	127	50-150	02/23/2023 1757
PFNA	15	14	30		1	112	50-150	02/23/2023 1757
PFOA	79	14	93		1	98	50-150	02/23/2023 1757
PFPeA	94	14	110		1	96	50-150	02/23/2023 1757
PFTeDA	ND	14	14		1	101	50-150	02/23/2023 1757
PFTrDA	ND	14	12		1	86	50-150	02/23/2023 1757
PFUdA	ND	14	15		1	109	50-150	02/23/2023 1757
PFOS	1100	13	1100	N	1	173	50-150	02/23/2023 1757

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	208	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		74	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB20006-005MS
Batch: 68230
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/22/2023 1719

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		105	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		99	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical®

Plant 2

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 146138

Client: Arcadis	Report to Contact: Kaitlin Hunt	Telephone No. / E-mail: 947-777-5215 kaitlin.Hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page: 1 of 1
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis		
Project Name: RACER Lansing			
Project No.: 30112892.0370A	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab (G) or Composite (C)	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	H2SO4	HCl	NaOH	ZnAc/NaOH	Field Filtered	PFAS (Meth 537 mod) by SGS Accutest, dilution 5.1 per QSM 5.1	Remarks / Cooler I.D.
MW-21-120_021623	2/16/23	0920	G	X			6							X	MS/MSD
MW-16-78_021623	2/16/23	1120	G	X			2							X	
DUP-02_021623	2/16/23	----	G	X			2							X	
EB-02_021623	2/16/23	1645	G	X			2							X	

YB20006

KESZ

Remarks / Cooler I.D.

Turn Around Time Required (Prior lab approval required for expedited TAT.)	Sample Disposal	Possible Hazard Identification	QC Requirements (Specify)
☒ Standard ☐ Rush (Specify)	☐ Return to Client ☒ Disposal by Lab	☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	

	Date	Time		Date	Time
1. Relinquished by: [signature] Austin Westhuis / Arcadis	2/17/23	1530	1. Received by: FedEx		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	Date: 02/18/23	Time: 1135	4. Laboratory received by: Shayla N Rolands	Date: 02/18/23	Time: 1135

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on ice (Circle): (Yes) No — Ice Pack — Receipt Temp: 1.9 °C — Temp Blank: ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: KNR / 02/18/2023 Lot #: YB20006

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID:

1.9 / 1.9 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # _____.
Time of preservation _____. If more than one preservative is needed, please note in the comments below.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA _____.

Comments: MW-21-139_021523 IS EXCESS

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Marina Samp

Project Name: RACER Lansing PFAS Delineation

Project Number: 30112892.0370B

Lot Number:**YB08034**

Date Completed:02/20/2023

02/20/2023 2:54 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

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Case Narrative
Arcadis U.S., Inc.
Lot Number: YB08034

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 180.1, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform. Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM2520 B, Residue-total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011, Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B. Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,4-Dioxane, 1,3,5-Trinitrobenzene, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4-Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12-Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5-Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YB08034-001, YB08034-003, YB08034-004, YB08034-006 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YB08034-002, YB08034-004, YB08034-005, YB08034-007. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside control limits: YB08034-001 (MS/MSD), YB08034-003, YB08034-006. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YB08034

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YB08034-001	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YB08034-001	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YB08034-001	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-001	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-001	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-002	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YB08034-002	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YB08034-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-002	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-002	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YB08034-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-003	1	13C5_PFHxA	M-03
PFAS by ID SOP	YB08034-003	1	13C5_PFPeA	M-03
PFAS by ID SOP	YB08034-004	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YB08034-004	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-005	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-005	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-005	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-006	1	Perfluorooctanesulfonic acid (PFOS)	M-03

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YB08034

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YB08034-006	1	13C2_4:2FTS	M-03
PFAS by ID SOP	YB08034-006	1	13C3_PFBS	M-03
PFAS by ID SOP	YB08034-006	1	13C5_PFPeA	M-03
PFAS by ID SOP	YB08034-007	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YB08034-007	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-007	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-007	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-007	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YB08034-007	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-007	1	13C2_4:2FTS	M-03
PFAS by ID SOP	YB08034-007	1	d5-EtFOSAA	M-03
PFAS by ID SOP	YB08034-001MS	1	9-chlorohexadecafluoro-3-oxanone-1-	M-03
PFAS by ID SOP	YB08034-001MD	1	11-chloroeicosafluoro-3-oxaundecane-	M-03
PFAS by ID SOP	YB08034-001MD	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	YB08034-001MD	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YQ67176-002	1	1H,1H,2H,2H-perfluorohexane sulfonic	M-03
PFAS by ID SOP	YB08034-001MS	1	1H,1H,2H,2H-perfluorohexane sulfonic	M-03
PFAS by ID SOP	YQ67176-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-001MS	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-001MD	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YQ67176-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-001MS	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-001MD	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YQ67176-002	1	Perfluoro-1-decanesulfonic acid (PFDS)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-1-decanesulfonic acid (PFDS)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-1-decanesulfonic acid (PFDS)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-1-heptanesulfonic acid	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-1-nonanesulfonic acid (PFNS)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-1-octanesulfonamide (PFOSA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-1-octanesulfonamide (PFOSA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-1-pentanesulfonic acid	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-dodecanoic acid (PFDoA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-dodecanoic acid (PFDoA)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YQ67176-002	1	Perfluoro-n-nonanoic acid (PFNA)	M-03

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YB08034

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YQ67176-001	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YQ67176-002	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YQ67176-002	1	Perfluoro-n-tridecanoic acid (PFTrDA)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YQ67176-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-001MS	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YB08034-001MD	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YQ67176-001	1	13C2_6:2FTS	M-03
PFAS by ID SOP	YQ67176-001	1	13C4_PFBA	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary
Arcadis U.S., Inc.
Lot Number: YB08034

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MichAve-MH-3_020723	Aqueous	02/07/2023 0915	02/08/2023
002	Verlinden-MH-5_020723	Aqueous	02/07/2023 0940	02/08/2023
003	Osborn-MH-1_020723	Aqueous	02/07/2023 1025	02/08/2023
004	DUP-01_020723	Aqueous	02/07/2023	02/08/2023
005	P3-MH-284_020723	Aqueous	02/07/2023 1100	02/08/2023
006	P2-MH-2_020723	Aqueous	02/07/2023 1125	02/08/2023
007	P2-MH-W_020723	Aqueous	02/07/2023 1205	02/08/2023
008	FB-01_020723	Aqueous	02/07/2023 1230	02/08/2023
009	EB-01_020723	Aqueous	02/07/2023 1232	02/08/2023

(9 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YB08034

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MichAve-MH-3_020723	Aqueous	PFBA	PFAS by ID	9.5	QM-03	ng/L	9
001	MichAve-MH-3_020723	Aqueous	PFHpA	PFAS by ID	1.8	JM-03	ng/L	9
001	MichAve-MH-3_020723	Aqueous	PFHxA	PFAS by ID	4.5	M-03	ng/L	9
001	MichAve-MH-3_020723	Aqueous	PFOA	PFAS by ID	3.9	JM-03	ng/L	9
001	MichAve-MH-3_020723	Aqueous	PFPeA	PFAS by ID	4.3		ng/L	9
001	MichAve-MH-3_020723	Aqueous	PFOS	PFAS by ID	3.3	JM-03	ng/L	9
002	Verlinden-MH-5_020723	Aqueous	6:2 FTS	PFAS by ID	5.4	JM-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFBS	PFAS by ID	2.9	JM-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFHxS	PFAS by ID	1.4	JM-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFBA	PFAS by ID	14		ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFHpA	PFAS by ID	16		ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFHxA	PFAS by ID	24	M-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFNA	PFAS by ID	2.1	J	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFOA	PFAS by ID	28	M-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFPeA	PFAS by ID	30	M-03	ng/L	11
002	Verlinden-MH-5_020723	Aqueous	PFOS	PFAS by ID	5.4	M-03	ng/L	11
003	Osborn-MH-1_020723	Aqueous	PFHxS	PFAS by ID	1.9	JM-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFBA	PFAS by ID	17	QM-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFDA	PFAS by ID	23	M-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFHpA	PFAS by ID	15	M-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFHxA	PFAS by ID	19	M-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFNA	PFAS by ID	12	M-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFOA	PFAS by ID	43	M-03	ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFPeA	PFAS by ID	18		ng/L	13
003	Osborn-MH-1_020723	Aqueous	PFOS	PFAS by ID	43	M-03	ng/L	13
004	DUP-01_020723	Aqueous	PFBA	PFAS by ID	17	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFDA	PFAS by ID	24	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFHpA	PFAS by ID	16	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFHxA	PFAS by ID	18	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFNA	PFAS by ID	13	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFOA	PFAS by ID	43	M-03	ng/L	15
004	DUP-01_020723	Aqueous	PFPeA	PFAS by ID	19		ng/L	15
004	DUP-01_020723	Aqueous	PFUdA	PFAS by ID	1.0	JM-03	ng/L	15
004	DUP-01_020723	Aqueous	PFOS	PFAS by ID	45	M-03	ng/L	15
005	P3-MH-284_020723	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	17
005	P3-MH-284_020723	Aqueous	PFBA	PFAS by ID	6.6		ng/L	17
005	P3-MH-284_020723	Aqueous	PFHxA	PFAS by ID	1.4	JM-03	ng/L	17
005	P3-MH-284_020723	Aqueous	PFOA	PFAS by ID	1.4	JM-03	ng/L	17
005	P3-MH-284_020723	Aqueous	PFOS	PFAS by ID	3.1	JM-03	ng/L	17
006	P2-MH-2_020723	Aqueous	PFHxS	PFAS by ID	2.0	JM-03	ng/L	19
006	P2-MH-2_020723	Aqueous	PFBA	PFAS by ID	13	Q	ng/L	19
006	P2-MH-2_020723	Aqueous	PFHpA	PFAS by ID	5.7	M-03	ng/L	19
006	P2-MH-2_020723	Aqueous	PFHxA	PFAS by ID	11	M-03	ng/L	19
006	P2-MH-2_020723	Aqueous	PFNA	PFAS by ID	1.5	JM-03	ng/L	19
006	P2-MH-2_020723	Aqueous	PFOA	PFAS by ID	13	M-03	ng/L	19

Detection Summary (Continued)

Lot Number: YB08034

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	P2-MH-2_020723	Aqueous	PFPeA	PFAS by ID	7.7		ng/L	19
006	P2-MH-2_020723	Aqueous	PFOS	PFAS by ID	7.6	M-03	ng/L	19
007	P2-MH-W_020723	Aqueous	PFBS	PFAS by ID	1.5	JM-03	ng/L	21
007	P2-MH-W_020723	Aqueous	PFHxS	PFAS by ID	1.5	JM-03	ng/L	21
007	P2-MH-W_020723	Aqueous	PFBA	PFAS by ID	5.3		ng/L	21
007	P2-MH-W_020723	Aqueous	PFHxA	PFAS by ID	1.1	JM-03	ng/L	21
007	P2-MH-W_020723	Aqueous	PFOA	PFAS by ID	2.1	JM-03	ng/L	21

(52 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-001**

Description: **MichAve-MH-3_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 0915**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1543	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.5**	**QM-03**	**4.2**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.8**	**JM-03**	**4.2**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.5**	**M-03**	**4.2**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.9**	**JM-03**	**4.2**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.3**		**4.2**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**JM-03**	**4.2**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	239	50-150
13C2_6:2FTS	N	162	50-150
13C2_8:2FTS		128	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		70	50-150
13C4_PFBA	N	49	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		102	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-001**
Description: **MichAve-MH-3_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 0915**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	50-150
13C8_PFOS		102	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-002**

Description: **Verlinden-MH-5_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 0940**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1638	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**5.4**	**JM-03**	**7.9**	**2.0**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.9	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**JM-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.1**	**J**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**28**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**30**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.4**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	208	50-150
13C2_6:2FTS		123	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		75	50-150
13C4_PFBA		55	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-002**
Description: **Verlinden-MH-5_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 0940**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	50-150
13C8_PFOS		95	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-003**

Description: **Osborn-MH-1_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1025**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1649	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**17**	**QM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**23**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**15**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**12**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**43**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**43**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	262	50-150
13C2_6:2FTS	N	245	50-150
13C2_8:2FTS	N	205	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		67	50-150
13C4_PFBA	N	47	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA	M-03	85	50-150
13C5_PFPeA	M-03	76	50-150
13C6_PFDA		110	50-150
13C7_PFUdA		109	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-003**
Description: **Osborn-MH-1_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1025**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		119	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-004**

Description: **DUP-01_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1700	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	M-03	7.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**17**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**24**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**18**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**13**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**43**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**19**		**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**1.0**	**JM-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**45**	**M-03**	**3.9**	**0.97**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	274	50-150
13C2_6:2FTS	N	273	50-150
13C2_8:2FTS	N	255	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		65	50-150
13C4_PFBA		53	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		87	50-150
13C5_PFPeA		73	50-150
13C6_PFDA		120	50-150
13C7_PFUdA		112	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-004**
Description: **DUP-01_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		101	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		131	50-150
d3-MeFOSAA		130	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-005**

Description: **P3-MH-284_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1100**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1711	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.5	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.5	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**4.3**	**1.1**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.6**		**4.3**	**1.1**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.3**	**1.1**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.3**	**1.1**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.3	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**JM-03**	**4.3**	**1.1**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	186	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		61	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		90	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-005**
Description: **P3-MH-284_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1100**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-006**

Description: **P2-MH-2_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1125**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1721	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.0**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**	**Q**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.7**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**11**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**13**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.7**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.6**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	M-03N	259	50-150
13C2_6:2FTS	N	230	50-150
13C2_8:2FTS	N	180	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		85	50-150
13C3_PFBS	M-03	87	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		64	50-150
13C4_PFBA	N	42	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA	M-03	69	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		111	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-006**
Description: **P2-MH-2_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1125**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		118	50-150
d3-MeFOSAA		117	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-007**

Description: **P2-MH-W_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1205**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1732	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.6	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**JM-03**	**3.8**	**0.95**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.5**	**JM-03**	**3.8**	**0.95**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.3**		**3.8**	**0.95**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.1**	**JM-03**	**3.8**	**0.95**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.1**	**JM-03**	**3.8**	**0.95**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	M-03	3.8	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	M-03	3.8	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	M-03N	185	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		55	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-007**
Description: **P2-MH-W_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1205**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA	M-03	90	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-008**

Description: **FB-01_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1230**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1743	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.4	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.2	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.2	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	50-150
13C2_6:2FTS		91	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-008**
Description: **FB-01_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1230**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YB08034-009**

Description: **EB-01_020723** Matrix: **Aqueous**

Date Sampled: **02/07/2023 1232**

Date Received: **02/08/2023**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	02/13/2023 1754	ALM	02/09/2023 1959	67176

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	50-150
13C2_6:2FTS		89	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YB08034-009**
Description: **EB-01_020723**
Matrix: **Aqueous**
Date Sampled: **02/07/2023 1232**
Date Received: **02/08/2023**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		85	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ67176-001
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	2.0	ng/L	02/13/2023 1343
11Cl-PF3OUdS	ND		1	8.0	2.0	ng/L	02/13/2023 1343
8:2 FTS	ND		1	8.0	2.0	ng/L	02/13/2023 1343
6:2 FTS	ND		1	8.0	2.0	ng/L	02/13/2023 1343
4:2 FTS	ND		1	8.0	2.0	ng/L	02/13/2023 1343
GenX	ND		1	8.0	2.0	ng/L	02/13/2023 1343
ADONA	ND		1	8.0	2.0	ng/L	02/13/2023 1343
EtFOSAA	ND		1	8.0	2.0	ng/L	02/13/2023 1343
MeFOSAA	ND		1	8.0	2.0	ng/L	02/13/2023 1343
PFBS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFDS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFHpS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFNS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFOSA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFPeS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFHxS	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFBA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFDA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFDoA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFHpA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFHxA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFNA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFOA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFPeA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFTeDA	ND	M-03	1	4.0	1.0	ng/L	02/13/2023 1343
PFTrDA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFUdA	ND		1	4.0	1.0	ng/L	02/13/2023 1343
PFOS	ND		1	4.0	1.0	ng/L	02/13/2023 1343

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	50-150
13C2_6:2FTS	M-03	93	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA	M-03	92	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ67176-001
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		100	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ67176-002
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	106	50-150	02/13/2023 1354
11Cl-PF3OUdS	15	16		1	106	50-150	02/13/2023 1354
8:2 FTS	15	16		1	107	67-138	02/13/2023 1354
6:2 FTS	15	17		1	111	64-140	02/13/2023 1354
4:2 FTS	15	18	M-03	1	118	63-143	02/13/2023 1354
GenX	32	36		1	114	50-150	02/13/2023 1354
ADONA	15	16		1	107	50-150	02/13/2023 1354
EtFOSAA	16	18	M-03	1	111	61-135	02/13/2023 1354
MeFOSAA	16	17	M-03	1	104	65-136	02/13/2023 1354
PFBS	14	15		1	104	72-130	02/13/2023 1354
PFDS	15	17	M-03	1	112	53-142	02/13/2023 1354
PFHpS	15	15		1	99	69-134	02/13/2023 1354
PFNS	15	16		1	107	69-127	02/13/2023 1354
PFOSA	16	16		1	100	67-137	02/13/2023 1354
PFPeS	15	15		1	97	71-127	02/13/2023 1354
PFHxS	15	15		1	100	68-131	02/13/2023 1354
PFBA	16	17		1	104	73-129	02/13/2023 1354
PFDA	16	17		1	106	71-129	02/13/2023 1354
PFDoA	16	16		1	98	72-134	02/13/2023 1354
PFHpA	16	16		1	97	72-130	02/13/2023 1354
PFHxA	16	16		1	101	72-129	02/13/2023 1354
PFNA	16	18	M-03	1	112	69-130	02/13/2023 1354
PFOA	16	16		1	101	71-133	02/13/2023 1354
PFPeA	16	16		1	102	72-129	02/13/2023 1354
PFTeDA	16	17	M-03	1	104	71-132	02/13/2023 1354
PFTrDA	16	17	M-03	1	104	65-144	02/13/2023 1354
PFUdA	16	16		1	103	69-133	02/13/2023 1354
PFOS	15	15	M-03	1	101	65-140	02/13/2023 1354

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		93	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		86	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		100	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ67176-002
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		95	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB08034-001MS
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	16	M-03	1	103	50-150	02/13/2023 1554
11Cl-PF3OUdS	ND	16	15		1	94	50-150	02/13/2023 1554
8:2 FTS	ND	16	16		1	101	67-138	02/13/2023 1554
6:2 FTS	ND	16	18		1	116	64-140	02/13/2023 1554
4:2 FTS	ND	15	18	M-03	1	114	63-143	02/13/2023 1554
GenX	ND	33	37		1	112	50-150	02/13/2023 1554
ADONA	ND	16	15		1	97	50-150	02/13/2023 1554
EtFOSAA	ND	17	18	M-03	1	107	61-135	02/13/2023 1554
MeFOSAA	ND	17	17	M-03	1	105	65-136	02/13/2023 1554
PFBS	ND	15	18	M-03	1	125	72-130	02/13/2023 1554
PFDS	ND	16	15	M-03	1	97	53-142	02/13/2023 1554
PFHpS	ND	16	15	M-03	1	97	69-134	02/13/2023 1554
PFNS	ND	16	16		1	100	69-127	02/13/2023 1554
PFOSA	ND	17	18	M-03	1	108	67-137	02/13/2023 1554
PFPeS	ND	15	15		1	98	71-127	02/13/2023 1554
PFHxS	ND	15	16	M-03	1	110	68-131	02/13/2023 1554
PFBA	9.5	17	26	M-03	1	98	73-129	02/13/2023 1554
PFDA	ND	17	16		1	97	71-129	02/13/2023 1554
PFDoA	ND	17	16	M-03	1	100	72-134	02/13/2023 1554
PFHpA	1.8	17	18		1	96	72-130	02/13/2023 1554
PFHxA	4.5	17	20	M-03	1	93	72-129	02/13/2023 1554
PFNA	ND	17	17	M-03	1	104	69-130	02/13/2023 1554
PFOA	3.9	17	21	M-03	1	102	71-133	02/13/2023 1554
PFPeA	4.3	17	20	M-03	1	93	72-129	02/13/2023 1554
PFTeDA	ND	17	17	M-03	1	103	71-132	02/13/2023 1554
PFTrDA	ND	17	15		1	93	65-144	02/13/2023 1554
PFUdA	ND	17	17	M-03	1	104	69-133	02/13/2023 1554
PFOS	3.3	15	17	M-03	1	90	65-140	02/13/2023 1554

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	245	50-150
13C2_6:2FTS	N	173	50-150
13C2_8:2FTS		129	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		107	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		52	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		83	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YB08034-001MS
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		111	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		105	50-150
13C8_PFOS		105	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB08034-001MD
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	16	16		1	104	1.9	50-150	30	02/13/2023 1605
11Cl-PF3OUdS	ND	16	16	M-03	1	102	9.5	50-150	30	02/13/2023 1605
8:2 FTS	ND	16	18	M-03	1	115	14	67-138	30	02/13/2023 1605
6:2 FTS	ND	16	19	M-03	1	120	3.9	64-140	30	02/13/2023 1605
4:2 FTS	ND	16	18		1	114	0.96	63-143	30	02/13/2023 1605
GenX	ND	33	39		1	118	6.2	50-150	30	02/13/2023 1605
ADONA	ND	16	15		1	96	0.40	50-150	30	02/13/2023 1605
EtFOSAA	ND	17	19	M-03	1	112	5.2	61-135	30	02/13/2023 1605
MeFOSAA	ND	17	17	M-03	1	102	1.9	65-136	30	02/13/2023 1605
PFBS	ND	15	18		1	120	3.5	72-130	30	02/13/2023 1605
PFDS	ND	16	16	M-03	1	99	3.2	53-142	30	02/13/2023 1605
PFHpS	ND	16	15		1	93	3.3	69-134	30	02/13/2023 1605
PFNS	ND	16	17	M-03	1	107	7.0	69-127	30	02/13/2023 1605
PFOSA	ND	17	17	M-03	1	102	4.2	67-137	30	02/13/2023 1605
PFPeS	ND	16	18	M-03	1	117	18	71-127	30	02/13/2023 1605
PFHxS	ND	15	17	M-03	1	115	5.6	68-131	30	02/13/2023 1605
PFBA	9.5	17	27		1	105	5.2	73-129	30	02/13/2023 1605
PFDA	ND	17	18		1	109	12	71-129	30	02/13/2023 1605
PFDoA	ND	17	18	M-03	1	107	8.2	72-134	30	02/13/2023 1605
PFHpA	1.8	17	19		1	105	8.7	72-130	30	02/13/2023 1605
PFHxA	4.5	17	22	M-03	1	106	11	72-129	30	02/13/2023 1605
PFNA	ND	17	17	M-03	1	104	0.93	69-130	30	02/13/2023 1605
PFOA	3.9	17	22	M-03	1	108	5.5	71-133	30	02/13/2023 1605
PFPeA	4.3	17	21		1	101	6.7	72-129	30	02/13/2023 1605
PFTeDA	ND	17	17	M-03	1	103	1.2	71-132	30	02/13/2023 1605
PFTrDA	ND	17	16		1	97	5.5	65-144	30	02/13/2023 1605
PFUdA	ND	17	17	M-03	1	103	0.55	69-133	30	02/13/2023 1605
PFOS	3.3	15	19	M-03	1	99	8.0	65-140	30	02/13/2023 1605

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	225	50-150
13C2_6:2FTS		147	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		71	50-150
13C4_PFBA	N	49	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		76	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YB08034-001MD
Batch: 67176
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 02/09/2023 1959

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		100	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		91	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		91	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 143097

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 / marina.samp@arcadis.com	Quote No.
Address: 28550 Cabot Dr, Ste 500	Sampler's Signature: x Anyssa Mandich	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Novi; State: MI; Zip Code: 48377	Printed Name: Anyssa Mandich		Pace Project No. YB08034
Project Name: RACER Lansing PFAS Delineation			Remarks / Cooler I.D.
Project No.: 30112892.0370B	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Solid	Non Aqueous	No of Containers by Preservative Type: Unpres.	HCl	HNO3	H2SO4	NaOH	ZnAc/NaOH	Field Filtered	EPA 537 M (Modified) PFAS (MS List of 28)	Remarks / Cooler I.D.
MichAve-MH-3_020723	2/7/2023	0915	G	X			6							6	MS/MSD
Verlinden-MH-5_020723	2/7/2023	0940	G	X			2							2	
OsBorn-MH-1_020723	2/7/2023	1025	G	X			2							2	Please provide results + QC along with EDD for all samples
DUP-01_020723	2/7/2023	—	G	X			2							2	
P3-MH-284_020723	2/7/2023	1100	G	X			2							2	
P2-MH-2_020723	2/7/2023	1125	G	X			2							2	
P2-MH-W_020723	2/7/2023	1205	G	X			2							2	
FB-01_020723	2/7/2023	1230	G	X			2							2	
EB-01_020723	2/7/2023	1232	G	X			2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

1. Relinquished by: Anyssa Mandich/Arcadis	Date: 2/7/23	Time: 1325	1. Received by: FedEx	Date: 2/7/23	Time: 1325
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	Date: 2/08/23	Time: 1010	4. Received by (Laboratory): [illegible]	Date: 02/08/23	Time: 1010

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): Yes / No; Ice Pack; Receipt Temp: 3.5 °C; Temp Blank: ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: BRB / 02/08/2023 Lot #: YB08034

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.5 / 3.5 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25015

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA . ☐

Time of preservation NA . If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA .

Comments:

Racer – Lansing Plant 2,3&6

Data Review

Lansing, Michigan

VOC Analyses

SDG # S45348, S45493 and S45494

VOCs Analyses Performed By:
Merit Laboratories Inc.
East Lansing, Michigan

Report #52346R
Review Level: Tier II
Project: 30171056.00603

Summary

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # S45348, S45493 and S45494 for samples collected in association with Plants 2, 3 & 6 in Lansing Michigan. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	1,4-D	PFAS	MET	MISC
S45348	MW-122-154	S45348-1	GW	02/13/23		X				
	MW-20-132	S45348-2	GW	02/14/23		X				
	MW-20-131	S45348-3	GW	02/14/23		X				
	DUP-06	S45348-4	GW	02/14/23	MW-20-131	X				
	Trip Blank	S45348-5	Water	02/13/23		X				
S45493	MW-19-121	S45493-1	GW	02/16/23			X			
	MW-19-122	S45493-2	GW	02/16/23			X			
	MW-20-129	S45493-3	GW	02/16/23			X			
	TW-14-02	S45493-4	GW	02/16/23			X			
S45494	MW-13-34	S45494-1	GW	02/17/23			X			
	TW-15-11	S45494-2	GW	02/17/23			X			
	MW-12-21	S45494-5	GW	02/17/23			X			
	PW-14-13	S45494-6	GW	02/17/23			X			
	AS-19-A07	S45494-7	GW	02/17/23			X			
	AS-19-A06	S45494-8	GW	02/17/23			X			
	MW-13-22	S45494-9	GW	02/17/23			X			
	DUP-04	S45494-10	GW	02/17/23	MW-13-34		X			

Note:

1. SDG (S45494) Sample TW-15-11 was used as the MS/MSD.

Analytical Data Package Documentation

The table below evaluates the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed chain-of-custody form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data package completeness and compliance		X		X	

Note:
QA = quality assurance

Organic Analysis Introduction

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260C and 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines NFG for Organic Superfund Methods Data Review, EPA-540-R-20-005 (November 2020), with reference to the historical (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate) and the Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound is considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

The "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R"

values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Volatile Organic Compounds Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C and 8260B by SIM	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2 with hydrochloric acid

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the reporting limit (RL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the RDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

For the SIM analysis, the samples were spiked with internal standards instead of surrogates. All internal standard recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations

where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSDs exhibited recoveries and RPDs within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
MW-20-132 MW-20-131 DUP-06 Trip Blank	trans-1,4-Dichloro-2-butene	<LL but >10%	<LL but >10%
	Diethyl ether	AC	>UL

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Field Duplicate Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate sample results for water matrices. For the case where the parent and/or duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/ Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-20-131 / DUP-06	Vinyl Chloride	3	2	AC
	cis-1,2-Dichloroethene	2	2	AC
MW-13-34 / DUP-04	1,4-Dioxane	U	U	AC

Notes:
AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for VOCs

1,4-DIOXANE: SW-846 8260C and 8260B by SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Internal Standard/Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE: 

DATE: December 19, 2023

PEER REVIEW: Joseph C. Houser

DATE: December 27, 2023

Chain of Custody Corrected Sample Analysis Data Sheets

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152332

CHAIN OF CUSTODY RECORD PLANT-6

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2246 CELL NO.: 947-777-5215 P.O. NO.: 30112892
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Cobon

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260 6 SIMS
45348.01	2/13/23	12:55	MW-22-154_021323	GW	3		3						X
.02	2/14/23	15:20	MW-20-132_021423	GW	3		3						X
.03	2/14/23	16:20	MW-20-131_021423	GW	3		3						X
.04	2/14/23	—	DUP-06_021423	GW	3		3						X
.05	2/13/23	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS ~~Sampler~~	DATE 2-15-23	TIME 0920
RECEIVED BY: SIGNATURE/ORGANIZATION	Johanna Murray	DATE 2/15/23	TIME 0920
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 8.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48030.01(01)+QC01
Generated on 05/08/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48030.01-S48030.02
Project: 30171056 / RACER Lansing
Collected Date(s): 05/01/2023
Submitted Date/Time: 05/01/2023 12:55
Sampled by: Austin Westhuis
P.O. #: 30171056

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QC Report (Pages 10-24)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48030.01	MW-22-154_050123	Groundwater	05/01/23 12:20
S48030.02	Trip Blank	Groundwater	05/01/23 00:01

Lab Sample ID: S48030.01
Sample Tag: MW-22-154_050123
Collected Date/Time: 05/01/2023 12:20
Matrix: Groundwater
COC Reference: 155617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/03/23 10:15	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/03/23 03:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48030.01 (continued)
Sample Tag: MW-22-154_050123

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/03/23 03:50, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48030.02
Sample Tag: Trip Blank
Collected Date/Time: 05/01/2023 00:01
Matrix: Groundwater
COC Reference: 155617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/03/23 10:15	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/03/23 01:29, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48030.02 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/03/23 01:29, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S48030.01(01)+QC01
Generated on 05/08/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48030.01-S48030.02
Project: 30171056 / RACER Lansing
Submitted Date/Time: 05/01/2023 12:55
Sampled by: Austin Westhuis
P.O. #: 30171056

QC Report Sections

Cover Page (Page 10)
Analysis Summary (Pages 11-12)
Prep Batch Summary (Page 13)
Surrogates per Lab Sample (Pages 14-15)
Surrogates per QC Sample (Page 16)
Internal Standards per Lab Sample (Pages 17-18)
Internal Standards per QC Sample (Page 19)
Batch QC Results (Pages 20-24)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S48030.01
Sample Tag: MW-22-154_050123
Collected Date/Time: 05/01/2023 12:20
Matrix: Groundwater
COC Reference: 155617

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/03/23 03:50	230502B7	VF230502W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S48030.02

Sample Tag: Trip Blank

Collected Date/Time: 05/01/2023 00:01

Matrix: Groundwater

COC Reference: 155617

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/03/23 01:29	230502B7	VF230502W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230502W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48030.01	Volatile Organics - DEQ List	SW5030C/8260C	05/03/23 03:50	230502B7
S48030.02	Volatile Organics - DEQ List	SW5030C/8260C	05/03/23 01:29	230502B7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48030.01

Sample Tag: MW-22-154_050123

Collected Date/Time: 05/01/2023 12:20

Matrix: Groundwater

COC Reference: 155617

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230502B7, Run Date: 05/03/2023 03:50, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**109.1**	80.0	124.0
1,2-Dichloroethane-D4		**82.3**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48030.02

Sample Tag: Trip Blank

Collected Date/Time: 05/01/2023 00:01

Matrix: Groundwater

COC Reference: 155617

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230502B7, Run Date: 05/03/2023 01:29, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**109.0**	80.0	124.0
1,2-Dichloroethane-D4		**82.5**	72.0	125.0
Toluene-D8		**94.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230502W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230502B7.BLKW02B

Run in Batch: 230502B7, Run Date: 05/03/2023 01:06, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.6**	80.0	124.0
1,2-Dichloroethane-D4		**84.5**	72.0	125.0
Toluene-D8		**93.6**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:32, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**112.4**	80.0	124.0
1,2-Dichloroethane-D4		**83.5**	72.0	125.0
Toluene-D8		**95.3**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230502B7.LCSDW02B, Parent Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:55, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**110.9**	80.0	124.0
1,2-Dichloroethane-D4		**82.8**	72.0	125.0
Toluene-D8		**93.3**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48030.01

Sample Tag: MW-22-154_050123

Collected Date/Time: 05/01/2023 12:20

Matrix: Groundwater

COC Reference: 155617

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230502B7, Run Date: 05/03/2023 03:50, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.8**	50.0	200.0
1,4-Difluorobenzene		**99.5**	50.0	200.0
Chlorobenzene-D5		**99.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48030.02

Sample Tag: Trip Blank

Collected Date/Time: 05/01/2023 00:01

Matrix: Groundwater

COC Reference: 155617

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230502B7, Run Date: 05/03/2023 01:29, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**96.7**	50.0	200.0
1,4-Difluorobenzene		**99.8**	50.0	200.0
Chlorobenzene-D5		**98.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**99.9**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230502W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230502B7.BLKW02B

Run in Batch: 230502B7, Run Date: 05/03/2023 01:06, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.2**	50.0	200.0
1,4-Difluorobenzene		**105.0**	50.0	200.0
Chlorobenzene-D5		**106.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**107.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:32, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**103.0**	50.0	200.0
1,4-Difluorobenzene		**103.9**	50.0	200.0
Chlorobenzene-D5		**104.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**106.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230502B7.LCSDW02B, Parent Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:55, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**105.0**	50.0	200.0
1,4-Difluorobenzene		**107.2**	50.0	200.0
Chlorobenzene-D5		**106.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**106.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230502W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230502B7.BLKW02B

Run in Batch: 230502B7, Run Date: 05/03/2023 01:06, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230502W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230502B7.BLKW02B

Run in Batch: 230502B7, Run Date: 05/03/2023 01:06, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:32, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		92.7	67.4	121.2
Acetone		136.3	29.9	161.5
Methyl iodide		94.8	68.8	116.4
Carbon disulfide		87.8	63.8	137.4
tert-Methyl butyl ether (MTBE)		87.6	73.2	122.4
Acrylonitrile		108.3	69.9	128.9
2-Butanone (MEK)		126.4	44.0	134.4
Dichlorodifluoromethane		86.3	10.0	222.8
Chloromethane		120.3	23.8	166.5
Vinyl chloride		103.6	43.5	149.1
Bromomethane		83.6	56.8	151.3
Chloroethane		97.1	53.4	149.4
Trichlorofluoromethane		89.7	59.7	151.8
1,1-Dichloroethene		94.8	69.6	139.4
Methylene chloride		87.6	73.3	121.1
trans-1,2-Dichloroethene		91.3	73.6	129.3
1,1-Dichloroethane		94.9	71.5	126.2
cis-1,2-Dichloroethene		83.5	76.6	122.1
Tetrahydrofuran	*	119.3	59.0	117.9
Chloroform		85.5	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230502W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:32, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		90.3	78.2	120.8
1,1,1-Trichloroethane	*	78.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		122.6	71.6	125.2
2-Hexanone		123.0	55.4	136.9
Carbon tetrachloride		99.2	72.6	133.0
Benzene		104.0	79.9	124.9
1,2-Dichloroethane		101.6	76.0	126.3
Trichloroethene		97.2	79.7	124.2
1,2-Dichloropropane		117.6	78.6	126.4
Bromodichloromethane		101.3	80.4	128.2
Dibromomethane		108.6	76.9	122.1
cis-1,3-Dichloropropene		100.9	79.8	129.9
Toluene		97.1	79.8	124.5
trans-1,3-Dichloropropene		99.3	74.0	131.3
1,1,2-Trichloroethane		101.1	78.7	123.1
Tetrachloroethene		101.7	74.5	124.5
trans-1,4-Dichloro-2-butene		121.5	68.6	135.4
Dibromochloromethane		116.7	74.6	127.2
1,2-Dibromoethane		111.0	70.3	133.7
Chlorobenzene		110.3	79.2	122.7
1,1,1,2-Tetrachloroethane		112.9	80.3	128.2
Ethylbenzene		106.6	79.5	129.1
p,m-Xylene		109.3	79.4	132.2
o-Xylene		105.6	80.2	131.0
Styrene		110.3	69.5	126.7
Isopropylbenzene		108.7	74.4	121.5
Bromoform		118.8	69.4	128.0
1,1,2,2-Tetrachloroethane		116.4	79.8	126.3
1,2,3-Trichloropropane		108.4	78.3	138.8
n-Propylbenzene		106.3	82.0	130.7
Bromobenzene		113.8	78.7	124.6
1,3,5-Trimethylbenzene		111.9	81.3	128.9
tert-Butylbenzene		101.8	80.7	128.9
1,2,4-Trimethylbenzene		110.7	81.4	130.8
sec-Butylbenzene		101.5	77.4	129.8
p-Isopropyltoluene		100.1	79.8	137.5
1,3-Dichlorobenzene		102.8	77.0	131.3
1,4-Dichlorobenzene		103.0	20.7	137.7
1,2-Dichlorobenzene		106.7	10.0	166.2
1,2,3-Trimethylbenzene		99.9	76.3	124.2
n-Butylbenzene		99.2	80.0	133.3
Hexachloroethane		115.4	23.8	138.1
1,2-Dibromo-3-chloropropane		123.7	21.2	189.4
1,2,4-Trichlorobenzene		121.1	27.4	143.4
1,2,3-Trichlorobenzene		120.9	75.4	131.4
Naphthalene		114.3	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230502W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:32, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		129.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230502B7.LCSDW02B, Parent Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:55, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		99.1	67.4	121.2	6.7	30.0
Acetone		138.1	29.9	161.5	1.3	30.0
Methyl iodide		91.1	68.8	116.4	4.0	30.0
Carbon disulfide		83.5	63.8	137.4	5.0	30.0
tert-Methyl butyl ether (MTBE)		85.2	73.2	122.4	2.8	30.0
Acrylonitrile		114.8	69.9	128.9	5.8	30.0
2-Butanone (MEK)		127.9	44.0	134.4	1.2	30.0
Dichlorodifluoromethane		80.1	10.0	222.8	7.5	30.0
Chloromethane		112.2	23.8	166.5	6.9	30.0
Vinyl chloride		92.8	43.5	149.1	11.0	30.0
Bromomethane		78.9	56.8	151.3	5.7	30.0
Chloroethane		91.4	53.4	149.4	6.0	30.0
Trichlorofluoromethane		84.6	59.7	151.8	5.9	30.0
1,1-Dichloroethene		92.1	69.6	139.4	2.9	30.0
Methylene chloride		83.9	73.3	121.1	4.3	30.0
trans-1,2-Dichloroethene		88.5	73.6	129.3	3.2	30.0
1,1-Dichloroethane		92.3	71.5	126.2	2.8	30.0
cis-1,2-Dichloroethene		80.7	76.6	122.1	3.4	30.0
Tetrahydrofuran	*	126.3	59.0	117.9	5.7	30.0
Chloroform		82.0	78.4	124.0	4.1	30.0
Bromochloromethane		89.1	78.2	120.8	1.3	30.0
1,1,1-Trichloroethane	*	75.2	79.4	130.9	3.8	30.0
4-Methyl-2-pentanone (MIBK)		119.6	71.6	125.2	2.5	30.0
2-Hexanone		127.9	55.4	136.9	3.9	30.0
Carbon tetrachloride		94.1	72.6	133.0	5.2	30.0
Benzene		99.5	79.9	124.9	4.4	30.0
1,2-Dichloroethane		97.0	76.0	126.3	4.6	30.0
Trichloroethene		95.3	79.7	124.2	2.0	30.0
1,2-Dichloropropane		112.5	78.6	126.4	4.5	30.0
Bromodichloromethane		97.7	80.4	128.2	3.6	30.0
Dibromomethane		105.8	76.9	122.1	2.6	30.0
cis-1,3-Dichloropropene		98.4	79.8	129.9	2.6	30.0
Toluene		93.1	79.8	124.5	4.1	30.0
trans-1,3-Dichloropropene		97.6	74.0	131.3	1.7	30.0
1,1,2-Trichloroethane		99.6	78.7	123.1	1.5	30.0
Tetrachloroethene		97.6	74.5	124.5	4.1	30.0
trans-1,4-Dichloro-2-butene		125.9	68.6	135.4	3.6	30.0
Dibromochloromethane		116.1	74.6	127.2	0.5	30.0
1,2-Dibromoethane		110.1	70.3	133.7	0.8	30.0
Chlorobenzene		106.8	79.2	122.7	3.3	30.0

Organics - Volatiles, Prep Batch ID: VF230502W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230502B7.LCSDW02B, Parent Sample ID: 230502B7.LCSW02B

Run in Batch: 230502B7, Run Date: 05/02/2023 23:55, Prep Date: 05/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		107.3	80.3	128.2	5.1	30.0
Ethylbenzene		103.9	79.5	129.1	2.6	30.0
p,m-Xylene		106.1	79.4	132.2	2.9	30.0
o-Xylene		103.9	80.2	131.0	1.6	30.0
Styrene		107.2	69.5	126.7	2.8	30.0
Isopropylbenzene		105.5	74.4	121.5	3.0	30.0
Bromoform		118.9	69.4	128.0	0.2	30.0
1,1,2,2-Tetrachloroethane		117.2	79.8	126.3	0.7	30.0
1,2,3-Trichloropropane		110.1	78.3	138.8	1.5	30.0
n-Propylbenzene		104.7	82.0	130.7	1.5	30.0
Bromobenzene		111.4	78.7	124.6	2.2	30.0
1,3,5-Trimethylbenzene		108.8	81.3	128.9	2.8	30.0
tert-Butylbenzene		98.9	80.7	128.9	2.9	30.0
1,2,4-Trimethylbenzene		107.9	81.4	130.8	2.6	30.0
sec-Butylbenzene		101.4	77.4	129.8	0.1	30.0
p-Isopropyltoluene		100.8	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		104.1	77.0	131.3	1.2	30.0
1,4-Dichlorobenzene		100.7	20.7	137.7	2.2	30.0
1,2-Dichlorobenzene		106.6	10.0	166.2	0.2	30.0
1,2,3-Trimethylbenzene		100.9	76.3	124.2	1.0	30.0
n-Butylbenzene		100.7	80.0	133.3	1.6	30.0
Hexachloroethane		117.1	23.8	138.1	1.5	30.0
1,2-Dibromo-3-chloropropane		129.3	21.2	189.4	4.4	30.0
1,2,4-Trichlorobenzene		124.2	27.4	143.4	2.6	30.0
1,2,3-Trichlorobenzene		122.2	75.4	131.4	1.1	30.0
Naphthalene		117.0	32.9	135.8	2.3	30.0
2-Methylnaphthalene		132.2	25.5	165.5	2.5	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48030
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056 / RACER Lansing
Submitted: 05/01/2023 12:55 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.5
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

155617

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-809-4013 CELL NO.: 947-777-5215 P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs
48030.01	5/1/23	1220	mw-22-154_050123	GW	3		3						X
.02	5/1/23	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / Arcadis ☒ Sampler DATE: 5/1/23 TIME: 1255
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 5/1/23 TIME: 1255

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 5/1/23 TIME: 1255
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 5/1/23 TIME: 1255

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.5

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.2

Analytical Laboratory Report

Report ID: S48713.01(01)+QC01
Generated on 05/26/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48713.01-S48713.08
Project: 30171056.0470A / RACER Lansing
Collected Date(s): 05/16/2023 - 05/17/2023
Submitted Date/Time: 05/17/2023 16:50
Sampled by: Jackie Schulte
P.O. #: 30171056.0470A

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48713.01	MW-21-139_051623	Groundwater	05/16/23 14:20
S48713.02	DUP-01_051623	Groundwater	05/16/23 00:01
S48713.03	MW-14-58R_051623	Groundwater	05/16/23 16:30
S48713.04	MW-22-156_051723	Groundwater	05/17/23 09:35
S48713.05	MW-22-153_051723	Groundwater	05/17/23 11:00
S48713.06	MW-22-155_051723	Groundwater	05/17/23 13:06
S48713.07	MW-22-157_051723	Groundwater	05/17/23 15:10
S48713.08	Trip Blank	Water	05/17/23 00:01

Analytical Laboratory Report

Lab Sample ID: S48713.01
Sample Tag: MW-21-139_051623
Collected Date/Time: 05/16/2023 14:20
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 14:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48713.02
Sample Tag: DUP-01_051623
Collected Date/Time: 05/16/2023 00:01
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 19:07, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S48713.03
Sample Tag: MW-14-58R_051623
Collected Date/Time: 05/16/2023 16:30
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 15:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	173	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48713.03 (continued)
Sample Tag: MW-14-58R_051623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:02, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48713.04
Sample Tag: MW-22-156_051723
Collected Date/Time: 05/17/2023 09:35
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 21:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	101	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:21, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	27	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	38	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	471	1		ug/L	1	75-34-3	E
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	1	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	

E-Concentration exceeds calibration range

Lab Sample ID: S48713.04 (continued)
Sample Tag: MW-22-156_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:21, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 05/23/23 20:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S48713.04 (continued)
Sample Tag: MW-22-156_051723

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 05/23/23 20:55, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	30	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	320	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S48713.04 (continued)

Sample Tag: MW-22-156_051723

Volatile Organics - DEQ List (Replicate 01), Method: SW5030C/8260C, Run Date: 05/23/23 20:55, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S48713.05
Sample Tag: MW-22-153_051723
Collected Date/Time: 05/17/2023 11:00
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 16:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	52	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48713.05 (continued)
Sample Tag: MW-22-153_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 17:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48713.06
Sample Tag: MW-22-155_051723
Collected Date/Time: 05/17/2023 13:06
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 22:24, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	270	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S48713.06 (continued)
Sample Tag: MW-22-155_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:01, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S48713.07
Sample Tag: MW-22-157_051723
Collected Date/Time: 05/17/2023 15:10
Matrix: Groundwater
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 16:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	44	1		ug/L	1	123-91-1	

Lab Sample ID: S48713.08
Sample Tag: Trip Blank
Collected Date/Time: 05/17/2023 00:01
Matrix: Water
COC Reference: 152804

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 16:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48713.08 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 16:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S48713.01(01)+QC01
Generated on 05/26/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48713.01-S48713.08
Project: 30171056.0470A / RACER Lansing
Submitted Date/Time: 05/17/2023 16:50
Sampled by: Jackie Schulte
P.O. #: 30171056.0470A

QC Report Sections

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Analysis Summary (Pages 22-29)
Prep Batch Summary (Page 30)
Surrogates per Lab Sample (Pages 31-35)
Surrogates per QC Sample (Pages 36-41)
Internal Standards per Lab Sample (Pages 42-49)
Internal Standards per QC Sample (Pages 50-55)
Batch QC Results (Pages 56-71)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48713.01
Sample Tag: MW-21-139_051623
Collected Date/Time: 05/16/2023 14:20
Matrix: Groundwater
COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 14:59	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48713.02

Sample Tag: DUP-01_051623

Collected Date/Time: 05/16/2023 00:01

Matrix: Groundwater

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 19:07	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48713.03

Sample Tag: MW-14-58R_051623

Collected Date/Time: 05/16/2023 16:30

Matrix: Groundwater

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 15:42	230523A9	VS230523W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:02	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48713.04

Sample Tag: MW-22-156_051723

Collected Date/Time: 05/17/2023 09:35

Matrix: Groundwater

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 21:56	230523A9	VS230523W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:21	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List (Replicate 01)	SW5030C/8260C	05/23/23 20:55	230523A3	VF230523W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S48713.05

Sample Tag: MW-22-153_051723

Collected Date/Time: 05/17/2023 11:00

Matrix: Groundwater

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 16:04	230523A9	VS230523W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:41	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48713.06

Sample Tag: MW-22-155_051723

Collected Date/Time: 05/17/2023 13:06

Matrix: Groundwater

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 22:24	230524A9	VS230524W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:01	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48713.07
Sample Tag: MW-22-157_051723
Collected Date/Time: 05/17/2023 15:10
Matrix: Groundwater
COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 16:48	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48713.08

Sample Tag: Trip Blank

Collected Date/Time: 05/17/2023 00:01

Matrix: Water

COC Reference: 152804

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 16:43	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230522W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48713.03	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:02	230522A9
S48713.04	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:21	230522A9
S48713.05	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 17:41	230522A9
S48713.06	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:01	230522A9
S48713.08	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 16:43	230522A9

Organics - Volatiles, Prep Batch ID: VF230523W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48713.04	Volatile Organics - DEQ List (Replicate 01)	SW5030C/8260C	05/23/23 20:55	230523A3

Organics - Volatiles, Prep Batch ID: VS230523W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48713.01	1,4-Dioxane	SW8260B - SIM	05/23/23 14:59	230523A9
S48713.03	1,4-Dioxane	SW8260B - SIM	05/23/23 15:42	230523A9
S48713.04	1,4-Dioxane	SW8260B - SIM	05/23/23 21:56	230523A9
S48713.05	1,4-Dioxane	SW8260B - SIM	05/23/23 16:04	230523A9
S48713.07	1,4-Dioxane	SW8260B - SIM	05/23/23 16:48	230523A9

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48713.06	1,4-Dioxane	SW8260B - SIM	05/24/23 22:24	230524A9

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48713.02	1,4-Dioxane	SW8260B - SIM	05/25/23 19:07	230525A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48713.03

Sample Tag: MW-14-58R_051623

Collected Date/Time: 05/16/2023 16:30

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:02, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.3**	80.0	124.0
1,2-Dichloroethane-D4		**121.0**	72.0	125.0
Toluene-D8		**101.9**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48713.04

Sample Tag: MW-22-156_051723

Collected Date/Time: 05/17/2023 09:35

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:21, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.4**	80.0	124.0
1,2-Dichloroethane-D4		**119.3**	72.0	125.0
Toluene-D8		**101.5**	89.0	112.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List (Replicate 01)

Run in Batch: 230523A3, Run Date: 05/23/2023 20:55, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**82.8**	72.0	125.0
Toluene-D8		**90.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48713.05

Sample Tag: MW-22-153_051723

Collected Date/Time: 05/17/2023 11:00

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:41, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.3**	80.0	124.0
1,2-Dichloroethane-D4		**122.2**	72.0	125.0
Toluene-D8		**100.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48713.06

Sample Tag: MW-22-155_051723

Collected Date/Time: 05/17/2023 13:06

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:01, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.9**	80.0	124.0
1,2-Dichloroethane-D4		**121.7**	72.0	125.0
Toluene-D8		**101.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48713.08

Sample Tag: Trip Blank

Collected Date/Time: 05/17/2023 00:01

Matrix: Water

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 16:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.8**	80.0	124.0
1,2-Dichloroethane-D4		**107.4**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230522W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**93.0**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**99.5**	89.0	112.0

Blank (BLK)

Lab Sample ID: 230522B9.BLKW22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**102.7**	86.0	118.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.7**	80.0	124.0
1,2-Dichloroethane-D4		**100.4**	72.0	125.0
Toluene-D8		**99.6**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:08, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**104.1**	86.0	118.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.2**	80.0	124.0
1,2-Dichloroethane-D4		**97.0**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522B9.LCSDG22A, Parent Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:27, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**103.7**	86.0	118.0

QC Report - Surrogates per QC Sample

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**102.6**	80.0	124.0
1,2-Dichloroethane-D4		**107.6**	72.0	125.0
Toluene-D8		**98.9**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**102.5**	80.0	124.0
1,2-Dichloroethane-D4		**102.4**	72.0	125.0
Toluene-D8		**100.9**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230523W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A3.BLKW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 14:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**95.5**	80.0	124.0
1,2-Dichloroethane-D4		**80.2**	72.0	125.0
Toluene-D8		**90.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 12:40, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**95.5**	80.0	124.0
1,2-Dichloroethane-D4		**76.0**	72.0	125.0
Toluene-D8		**91.7**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A3.LCSDW23A, Parent Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 13:04, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**79.0**	72.0	125.0
Toluene-D8		**91.7**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230523W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.01

Sample Tag: MW-21-139_051623

Collected Date/Time: 05/16/2023 14:20

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 14:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**109.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.02

Sample Tag: DUP-01_051623

Collected Date/Time: 05/16/2023 00:01

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 19:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.03

Sample Tag: MW-14-58R_051623

Collected Date/Time: 05/16/2023 16:30

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 15:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**110.0**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**83.3**	50.0	200.0
1,4-Difluorobenzene		**89.6**	50.0	200.0
Chlorobenzene-D5		**92.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**84.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.04

Sample Tag: MW-22-156_051723

Collected Date/Time: 05/17/2023 09:35

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 21:56, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**109.1**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:21, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**81.6**	50.0	200.0
1,4-Difluorobenzene		**87.4**	50.0	200.0
Chlorobenzene-D5		**88.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**80.0**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List (Replicate 01)

Run in Batch: 230523A3, Run Date: 05/23/2023 20:55, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**95.5**	50.0	200.0
1,4-Difluorobenzene		**96.6**	50.0	200.0
Chlorobenzene-D5		**95.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.05

Sample Tag: MW-22-153_051723

Collected Date/Time: 05/17/2023 11:00

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 16:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**108.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 17:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**83.3**	50.0	200.0
1,4-Difluorobenzene		**89.6**	50.0	200.0
Chlorobenzene-D5		**91.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**83.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.06

Sample Tag: MW-22-155_051723

Collected Date/Time: 05/17/2023 13:06

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 22:24, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**75.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**82.2**	50.0	200.0
1,4-Difluorobenzene		**88.9**	50.0	200.0
Chlorobenzene-D5		**91.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**83.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.07

Sample Tag: MW-22-157_051723

Collected Date/Time: 05/17/2023 15:10

Matrix: Groundwater

COC Reference: 152804

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 16:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48713.08

Sample Tag: Trip Blank

Collected Date/Time: 05/17/2023 00:01

Matrix: Water

COC Reference: 152804

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 16:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**87.2**	50.0	200.0
1,4-Difluorobenzene		**91.3**	50.0	200.0
Chlorobenzene-D5		**91.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**78.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230522W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.6**	50.0	200.0
1,4-Difluorobenzene		**97.3**	50.0	200.0
Chlorobenzene-D5		**95.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**84.0**	50.0	200.0

Blank (BLK)

Lab Sample ID: 230522B9.BLKW22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**93.6**	50.0	200.0
Chlorobenzene-D5		**91.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**105.6**	50.0	200.0
1,4-Difluorobenzene		**105.9**	50.0	200.0
Chlorobenzene-D5		**104.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**105.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:08, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**94.7**	50.0	200.0
Chlorobenzene-D5		**93.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**102.1**	50.0	200.0
1,4-Difluorobenzene		**101.5**	50.0	200.0
Chlorobenzene-D5		**98.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.9**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522B9.LCSDG22A, Parent Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:27, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**97.7**	50.0	200.0
Chlorobenzene-D5		**96.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.5**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.3**	50.0	200.0
1,4-Difluorobenzene		**99.5**	50.0	200.0
Chlorobenzene-D5		**101.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.7**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.9**	50.0	200.0
1,4-Difluorobenzene		**100.6**	50.0	200.0
Chlorobenzene-D5		**101.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.1**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230523W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A3.BLKW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 14:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**93.0**	50.0	200.0
1,4-Difluorobenzene		**93.3**	50.0	200.0
Chlorobenzene-D5		**91.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**90.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 12:40, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.7**	50.0	200.0
1,4-Difluorobenzene		**95.0**	50.0	200.0
Chlorobenzene-D5		**92.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**90.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A3.LCSDW23A, Parent Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 13:04, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.4**	50.0	200.0
1,4-Difluorobenzene		**94.0**	50.0	200.0
Chlorobenzene-D5		**92.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230523W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**109.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**106.7**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**88.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**111.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230522W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		113.3	67.4	121.2
Acetone		113.3	29.9	161.5
Methyl iodide	*	117.6	68.8	116.4
Carbon disulfide		120.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		117.9	73.2	122.4
Acrylonitrile		110.6	69.9	128.9
2-Butanone (MEK)		109.9	44.0	134.4
Dichlorodifluoromethane		108.2	10.0	222.8
Chloromethane		114.7	23.8	166.5
Vinyl chloride		113.0	43.5	149.1
Bromomethane		113.2	56.8	151.3
Chloroethane		109.5	53.4	149.4
Trichlorofluoromethane		111.2	59.7	151.8
1,1-Dichloroethene		117.7	69.6	139.4
Methylene chloride		112.7	73.3	121.1
trans-1,2-Dichloroethene		115.5	73.6	129.3
1,1-Dichloroethane		114.3	71.5	126.2
cis-1,2-Dichloroethene		113.1	76.6	122.1
Tetrahydrofuran		107.4	59.0	117.9
Chloroform		113.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		112.8	78.2	120.8
1,1,1-Trichloroethane		114.3	79.4	130.9
4-Methyl-2-pentanone (MIBK)		116.3	71.6	125.2
2-Hexanone		119.5	55.4	136.9
Carbon tetrachloride		113.7	72.6	133.0
Benzene		112.2	79.9	124.9
1,2-Dichloroethane		109.9	76.0	126.3
Trichloroethene		113.3	79.7	124.2
1,2-Dichloropropane		111.5	78.6	126.4
Bromodichloromethane		110.4	80.4	128.2
Dibromomethane		109.4	76.9	122.1
cis-1,3-Dichloropropene		115.5	79.8	129.9
Toluene		113.9	79.8	124.5
trans-1,3-Dichloropropene		114.9	74.0	131.3
1,1,2-Trichloroethane		108.9	78.7	123.1
Tetrachloroethene		114.2	74.5	124.5
trans-1,4-Dichloro-2-butene		118.7	68.6	135.4
Dibromochloromethane		112.2	74.6	127.2
1,2-Dibromoethane		112.0	70.3	133.7
Chlorobenzene		112.5	79.2	122.7
1,1,1,2-Tetrachloroethane		115.5	80.3	128.2
Ethylbenzene		115.1	79.5	129.1
p,m-Xylene		116.3	79.4	132.2
o-Xylene		115.7	80.2	131.0
Styrene		114.9	69.5	126.7
Isopropylbenzene		117.4	74.4	121.5
Bromoform		113.3	69.4	128.0
1,1,2,2-Tetrachloroethane		114.4	79.8	126.3
1,2,3-Trichloropropane		108.4	78.3	138.8
n-Propylbenzene		116.8	82.0	130.7
Bromobenzene		114.2	78.7	124.6
1,3,5-Trimethylbenzene		116.1	81.3	128.9
tert-Butylbenzene		116.8	80.7	128.9
1,2,4-Trimethylbenzene		119.6	81.4	130.8
sec-Butylbenzene		115.9	77.4	129.8
p-Isopropyltoluene		115.6	79.8	137.5
1,3-Dichlorobenzene		113.1	77.0	131.3
1,4-Dichlorobenzene		113.8	20.7	137.7
1,2-Dichlorobenzene		113.3	10.0	166.2
1,2,3-Trimethylbenzene		114.6	76.3	124.2
n-Butylbenzene		115.6	80.0	133.3
Hexachloroethane		118.7	23.8	138.1
1,2-Dibromo-3-chloropropane		113.3	21.2	189.4
1,2,4-Trichlorobenzene		114.3	27.4	143.4
1,2,3-Trichlorobenzene		115.3	75.4	131.4
Naphthalene		114.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		122.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		110.2	67.4	121.2	2.8	30.0
Acetone		112.8	29.9	161.5	0.4	30.0
Methyl iodide		116.2	68.8	116.4	1.2	30.0
Carbon disulfide		118.7	63.8	137.4	1.6	30.0
tert-Methyl butyl ether (MTBE)		117.6	73.2	122.4	0.3	30.0
Acrylonitrile		114.8	69.9	128.9	3.8	30.0
2-Butanone (MEK)		114.7	44.0	134.4	4.2	30.0
Dichlorodifluoromethane		120.1	10.0	222.8	10.4	30.0
Chloromethane		113.2	23.8	166.5	1.2	30.0
Vinyl chloride		113.9	43.5	149.1	0.8	30.0
Bromomethane		110.1	56.8	151.3	2.8	30.0
Chloroethane		107.2	53.4	149.4	2.2	30.0
Trichlorofluoromethane		115.6	59.7	151.8	3.9	30.0
1,1-Dichloroethene		117.1	69.6	139.4	0.6	30.0
Methylene chloride		110.6	73.3	121.1	1.9	30.0
trans-1,2-Dichloroethene		113.4	73.6	129.3	1.9	30.0
1,1-Dichloroethane		112.5	71.5	126.2	1.6	30.0
cis-1,2-Dichloroethene		111.9	76.6	122.1	1.0	30.0
Tetrahydrofuran		111.7	59.0	117.9	3.9	30.0
Chloroform		110.8	78.4	124.0	2.2	30.0
Bromochloromethane		113.2	78.2	120.8	0.3	30.0
1,1,1-Trichloroethane		111.4	79.4	130.9	2.6	30.0
4-Methyl-2-pentanone (MIBK)		118.7	71.6	125.2	2.1	30.0
2-Hexanone		121.8	55.4	136.9	1.9	30.0
Carbon tetrachloride		115.7	72.6	133.0	1.7	30.0
Benzene		110.4	79.9	124.9	1.7	30.0
1,2-Dichloroethane		108.1	76.0	126.3	1.6	30.0
Trichloroethene		113.2	79.7	124.2	0.1	30.0
1,2-Dichloropropane		110.8	78.6	126.4	0.6	30.0
Bromodichloromethane		110.3	80.4	128.2	0.1	30.0
Dibromomethane		109.6	76.9	122.1	0.2	30.0
cis-1,3-Dichloropropene		111.9	79.8	129.9	3.2	30.0
Toluene		111.5	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		113.6	74.0	131.3	1.1	30.0
1,1,2-Trichloroethane		109.7	78.7	123.1	0.7	30.0
Tetrachloroethene		113.0	74.5	124.5	1.1	30.0
trans-1,4-Dichloro-2-butene		121.1	68.6	135.4	2.0	30.0
Dibromochloromethane		113.9	74.6	127.2	1.5	30.0
1,2-Dibromoethane		114.0	70.3	133.7	1.7	30.0
Chlorobenzene		111.4	79.2	122.7	1.0	30.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		112.5	80.3	128.2	2.6	30.0
Ethylbenzene		113.6	79.5	129.1	1.3	30.0
p,m-Xylene		115.1	79.4	132.2	1.0	30.0
o-Xylene		114.9	80.2	131.0	0.7	30.0
Styrene		114.1	69.5	126.7	0.7	30.0
Isopropylbenzene		116.7	74.4	121.5	0.6	30.0
Bromoform		115.7	69.4	128.0	2.1	30.0
1,1,2,2-Tetrachloroethane		117.3	79.8	126.3	2.6	30.0
1,2,3-Trichloropropane		111.5	78.3	138.8	2.8	30.0
n-Propylbenzene		116.8	82.0	130.7	0.1	30.0
Bromobenzene		114.5	78.7	124.6	0.3	30.0
1,3,5-Trimethylbenzene		115.8	81.3	128.9	0.3	30.0
tert-Butylbenzene		116.6	80.7	128.9	0.2	30.0
1,2,4-Trimethylbenzene		118.1	81.4	130.8	1.3	30.0
sec-Butylbenzene		117.4	77.4	129.8	1.3	30.0
p-Isopropyltoluene		117.0	79.8	137.5	1.2	30.0
1,3-Dichlorobenzene		113.1	77.0	131.3	0.0	30.0
1,4-Dichlorobenzene		113.9	20.7	137.7	0.0	30.0
1,2-Dichlorobenzene		114.8	10.0	166.2	1.4	30.0
1,2,3-Trimethylbenzene		114.9	76.3	124.2	0.3	30.0
n-Butylbenzene		115.7	80.0	133.3	0.1	30.0
Hexachloroethane		119.6	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		120.6	21.2	189.4	6.2	30.0
1,2,4-Trichlorobenzene		118.1	27.4	143.4	3.3	30.0
1,2,3-Trichlorobenzene		118.3	75.4	131.4	2.6	30.0
Naphthalene		122.6	32.9	135.8	6.8	30.0
2-Methylnaphthalene		130.2	25.5	165.5	6.5	30.0

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		113.9	67.4	121.2
Acetone		115.4	29.9	161.5
Methyl iodide		116.0	68.8	116.4
Carbon disulfide		117.8	63.8	137.4
tert-Methyl butyl ether (MTBE)		117.7	73.2	122.4
Acrylonitrile		115.8	69.9	128.9
2-Butanone (MEK)		117.0	44.0	134.4
Dichlorodifluoromethane		118.0	10.0	222.8
Chloromethane		109.2	23.8	166.5
Vinyl chloride		113.6	43.5	149.1
Bromomethane		109.1	56.8	151.3
Chloroethane		107.3	53.4	149.4
Trichlorofluoromethane		116.2	59.7	151.8
1,1-Dichloroethene		116.6	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		111.5	73.3	121.1
trans-1,2-Dichloroethene		112.1	73.6	129.3
1,1-Dichloroethane		111.8	71.5	126.2
cis-1,2-Dichloroethene		112.1	76.6	122.1
Tetrahydrofuran		108.5	59.0	117.9
Chloroform		112.4	78.4	124.0
Bromochloromethane		114.5	78.2	120.8
1,1,1-Trichloroethane		110.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		118.8	71.6	125.2
2-Hexanone		121.1	55.4	136.9
Carbon tetrachloride		113.3	72.6	133.0
Benzene		110.7	79.9	124.9
1,2-Dichloroethane		109.7	76.0	126.3
Trichloroethene		110.3	79.7	124.2
1,2-Dichloropropane		112.0	78.6	126.4
Bromodichloromethane		110.1	80.4	128.2
Dibromomethane		110.7	76.9	122.1
cis-1,3-Dichloropropene		111.2	79.8	129.9
Toluene		110.0	79.8	124.5
trans-1,3-Dichloropropene		112.9	74.0	131.3
1,1,2-Trichloroethane		112.0	78.7	123.1
Tetrachloroethene		110.3	74.5	124.5
trans-1,4-Dichloro-2-butene		110.3	68.6	135.4
Dibromochloromethane		109.7	74.6	127.2
1,2-Dibromoethane		108.7	70.3	133.7
Chlorobenzene		106.6	79.2	122.7
1,1,1,2-Tetrachloroethane		108.5	80.3	128.2
Ethylbenzene		107.6	79.5	129.1
p,m-Xylene		108.6	79.4	132.2
o-Xylene		108.5	80.2	131.0
Styrene		109.6	69.5	126.7
Isopropylbenzene		109.8	74.4	121.5
Bromoform		109.4	69.4	128.0
1,1,2,2-Tetrachloroethane		110.7	79.8	126.3
1,2,3-Trichloropropane		108.7	78.3	138.8
n-Propylbenzene		109.3	82.0	130.7
Bromobenzene		109.5	78.7	124.6
1,3,5-Trimethylbenzene		108.2	81.3	128.9
tert-Butylbenzene		107.5	80.7	128.9
1,2,4-Trimethylbenzene		111.9	81.4	130.8
sec-Butylbenzene		105.1	77.4	129.8
p-Isopropyltoluene		104.0	79.8	137.5
1,3-Dichlorobenzene		103.1	77.0	131.3
1,4-Dichlorobenzene		104.6	20.7	137.7
1,2-Dichlorobenzene		105.8	10.0	166.2
1,2,3-Trimethylbenzene		105.2	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		100.4	80.0	133.3
Hexachloroethane		103.4	23.8	138.1
1,2-Dibromo-3-chloropropane		107.3	21.2	189.4
1,2,4-Trichlorobenzene		101.8	27.4	143.4
1,2,3-Trichlorobenzene		102.7	75.4	131.4
Naphthalene		107.5	32.9	135.8
2-Methylnaphthalene		106.2	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		108.4	67.4	121.2	4.9	30.0
Acetone		111.2	29.9	161.5	3.5	30.0
Methyl iodide		113.0	68.8	116.4	2.7	30.0
Carbon disulfide		114.8	63.8	137.4	2.5	30.0
tert-Methyl butyl ether (MTBE)		114.5	73.2	122.4	2.7	30.0
Acrylonitrile		112.0	69.9	128.9	3.3	30.0
2-Butanone (MEK)		109.7	44.0	134.4	6.5	30.0
Dichlorodifluoromethane		106.5	10.0	222.8	10.2	30.0
Chloromethane		108.5	23.8	166.5	0.7	30.0
Vinyl chloride		110.9	43.5	149.1	2.4	30.0
Bromomethane		106.5	56.8	151.3	2.4	30.0
Chloroethane		105.6	53.4	149.4	1.7	30.0
Trichlorofluoromethane		110.2	59.7	151.8	5.3	30.0
1,1-Dichloroethene		113.8	69.6	139.4	2.4	30.0
Methylene chloride		110.2	73.3	121.1	1.2	30.0
trans-1,2-Dichloroethene		110.4	73.6	129.3	1.5	30.0
1,1-Dichloroethane		109.9	71.5	126.2	1.7	30.0
cis-1,2-Dichloroethene		109.1	76.6	122.1	2.7	30.0
Tetrahydrofuran		98.7	59.0	117.9	9.5	30.0
Chloroform		109.6	78.4	124.0	2.5	30.0
Bromochloromethane		110.8	78.2	120.8	3.3	30.0
1,1,1-Trichloroethane		109.6	79.4	130.9	1.2	30.0
4-Methyl-2-pentanone (MIBK)		113.9	71.6	125.2	4.2	30.0
2-Hexanone		116.3	55.4	136.9	4.0	30.0
Carbon tetrachloride		112.9	72.6	133.0	0.3	30.0
Benzene		107.9	79.9	124.9	2.6	30.0
1,2-Dichloroethane		105.9	76.0	126.3	3.5	30.0
Trichloroethene		109.6	79.7	124.2	0.7	30.0
1,2-Dichloropropane		108.8	78.6	126.4	2.8	30.0
Bromodichloromethane		107.3	80.4	128.2	2.5	30.0
Dibromomethane		109.0	76.9	122.1	1.5	30.0
cis-1,3-Dichloropropene		108.4	79.8	129.9	2.6	30.0
Toluene		109.1	79.8	124.5	0.8	30.0
trans-1,3-Dichloropropene		109.5	74.0	131.3	3.0	30.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		108.0	78.7	123.1	3.6	30.0
Tetrachloroethene		108.2	74.5	124.5	1.8	30.0
trans-1,4-Dichloro-2-butene		106.5	68.6	135.4	3.5	30.0
Dibromochloromethane		106.8	74.6	127.2	2.7	30.0
1,2-Dibromoethane		107.9	70.3	133.7	0.8	30.0
Chlorobenzene		105.5	79.2	122.7	1.0	30.0
1,1,1,2-Tetrachloroethane		107.1	80.3	128.2	1.3	30.0
Ethylbenzene		107.0	79.5	129.1	0.5	30.0
p,m-Xylene		107.9	79.4	132.2	0.6	30.0
o-Xylene		108.7	80.2	131.0	0.2	30.0
Styrene		108.4	69.5	126.7	1.1	30.0
Isopropylbenzene		109.2	74.4	121.5	0.6	30.0
Bromoform		106.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		111.7	79.8	126.3	0.9	30.0
1,2,3-Trichloropropane		104.5	78.3	138.8	3.9	30.0
n-Propylbenzene		108.6	82.0	130.7	0.7	30.0
Bromobenzene		108.6	78.7	124.6	0.8	30.0
1,3,5-Trimethylbenzene		108.4	81.3	128.9	0.2	30.0
tert-Butylbenzene		108.7	80.7	128.9	1.1	30.0
1,2,4-Trimethylbenzene		111.7	81.4	130.8	0.2	30.0
sec-Butylbenzene		107.1	77.4	129.8	1.8	30.0
p-Isopropyltoluene		106.7	79.8	137.5	2.5	30.0
1,3-Dichlorobenzene		103.8	77.0	131.3	0.7	30.0
1,4-Dichlorobenzene		104.9	20.7	137.7	0.3	30.0
1,2-Dichlorobenzene		106.6	10.0	166.2	0.8	30.0
1,2,3-Trimethylbenzene		106.1	76.3	124.2	0.9	30.0
n-Butylbenzene		103.4	80.0	133.3	3.0	30.0
Hexachloroethane		106.3	23.8	138.1	2.8	30.0
1,2-Dibromo-3-chloropropane		107.5	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		104.8	27.4	143.4	2.9	30.0
1,2,3-Trichlorobenzene		105.9	75.4	131.4	3.0	30.0
Naphthalene		108.2	32.9	135.8	0.6	30.0
2-Methylnaphthalene		109.5	25.5	165.5	3.0	30.0

Organics - Volatiles, Prep Batch ID: VF230523W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A3.BLKW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 14:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230523W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230523A3.BLKW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 14:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 12:40, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		110.7	67.4	121.2
Acetone		79.0	29.9	161.5
Methyl iodide		108.9	68.8	116.4
Carbon disulfide		116.5	63.8	137.4
tert-Methyl butyl ether (MTBE)		95.2	73.2	122.4
Acrylonitrile		95.6	69.9	128.9
2-Butanone (MEK)		87.4	44.0	134.4
Dichlorodifluoromethane		115.0	10.0	222.8
Chloromethane		128.7	23.8	166.5
Vinyl chloride		126.3	43.5	149.1
Bromomethane		105.7	56.8	151.3
Chloroethane		112.0	53.4	149.4
Trichlorofluoromethane		96.3	59.7	151.8
1,1-Dichloroethene		103.2	69.6	139.4
Methylene chloride		106.9	73.3	121.1
trans-1,2-Dichloroethene		101.1	73.6	129.3
1,1-Dichloroethane		103.5	71.5	126.2
cis-1,2-Dichloroethene		104.4	76.6	122.1
Tetrahydrofuran		78.0	59.0	117.9
Chloroform		97.4	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230523W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 12:40, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		101.0	78.2	120.8
1,1,1-Trichloroethane		91.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		95.4	71.6	125.2
2-Hexanone		96.7	55.4	136.9
Carbon tetrachloride		92.8	72.6	133.0
Benzene		105.1	79.9	124.9
1,2-Dichloroethane		77.9	76.0	126.3
Trichloroethene		100.6	79.7	124.2
1,2-Dichloropropane		100.2	78.6	126.4
Bromodichloromethane		94.0	80.4	128.2
Dibromomethane		96.6	76.9	122.1
cis-1,3-Dichloropropene		103.3	79.8	129.9
Toluene		100.8	79.8	124.5
trans-1,3-Dichloropropene		99.1	74.0	131.3
1,1,2-Trichloroethane		99.0	78.7	123.1
Tetrachloroethene		100.4	74.5	124.5
trans-1,4-Dichloro-2-butene		88.3	68.6	135.4
Dibromochloromethane		104.3	74.6	127.2
1,2-Dibromoethane		104.0	70.3	133.7
Chlorobenzene		108.2	79.2	122.7
1,1,1,2-Tetrachloroethane		104.3	80.3	128.2
Ethylbenzene		108.0	79.5	129.1
p,m-Xylene		105.5	79.4	132.2
o-Xylene		104.2	80.2	131.0
Styrene		106.0	69.5	126.7
Isopropylbenzene		106.7	74.4	121.5
Bromoform		102.8	69.4	128.0
1,1,2,2-Tetrachloroethane		106.5	79.8	126.3
1,2,3-Trichloropropane		96.8	78.3	138.8
n-Propylbenzene		108.4	82.0	130.7
Bromobenzene		101.5	78.7	124.6
1,3,5-Trimethylbenzene		104.4	81.3	128.9
tert-Butylbenzene		96.3	80.7	128.9
1,2,4-Trimethylbenzene		103.2	81.4	130.8
sec-Butylbenzene		111.4	77.4	129.8
p-Isopropyltoluene		109.8	79.8	137.5
1,3-Dichlorobenzene		104.9	77.0	131.3
1,4-Dichlorobenzene		105.8	20.7	137.7
1,2-Dichlorobenzene		105.3	10.0	166.2
1,2,3-Trimethylbenzene		106.5	76.3	124.2
n-Butylbenzene		110.2	80.0	133.3
Hexachloroethane		117.0	23.8	138.1
1,2-Dibromo-3-chloropropane		104.0	21.2	189.4
1,2,4-Trichlorobenzene		105.8	27.4	143.4
1,2,3-Trichlorobenzene		103.3	75.4	131.4
Naphthalene		103.9	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230523W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 12:40, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		98.4	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A3.LCSDW23A, Parent Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 13:04, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		108.8	67.4	121.2	1.7	30.0
Acetone		84.0	29.9	161.5	6.1	30.0
Methyl iodide		99.9	68.8	116.4	8.6	30.0
Carbon disulfide		105.4	63.8	137.4	10.0	30.0
tert-Methyl butyl ether (MTBE)		95.2	73.2	122.4	0.1	30.0
Acrylonitrile		97.7	69.9	128.9	2.2	30.0
2-Butanone (MEK)		91.6	44.0	134.4	4.6	30.0
Dichlorodifluoromethane		108.3	10.0	222.8	6.0	30.0
Chloromethane		120.7	23.8	166.5	6.4	30.0
Vinyl chloride		115.2	43.5	149.1	9.2	30.0
Bromomethane		96.0	56.8	151.3	9.6	30.0
Chloroethane		104.6	53.4	149.4	6.8	30.0
Trichlorofluoromethane		87.3	59.7	151.8	9.7	30.0
1,1-Dichloroethene		92.5	69.6	139.4	10.9	30.0
Methylene chloride		101.5	73.3	121.1	5.2	30.0
trans-1,2-Dichloroethene		92.9	73.6	129.3	8.4	30.0
1,1-Dichloroethane		96.8	71.5	126.2	6.7	30.0
cis-1,2-Dichloroethene		98.5	76.6	122.1	5.7	30.0
Tetrahydrofuran		80.4	59.0	117.9	3.1	30.0
Chloroform		91.4	78.4	124.0	6.4	30.0
Bromochloromethane		98.0	78.2	120.8	3.0	30.0
1,1,1-Trichloroethane		84.5	79.4	130.9	7.6	30.0
4-Methyl-2-pentanone (MIBK)		101.4	71.6	125.2	6.1	30.0
2-Hexanone		104.1	55.4	136.9	7.4	30.0
Carbon tetrachloride		86.7	72.6	133.0	6.8	30.0
Benzene		98.3	79.9	124.9	6.7	30.0
1,2-Dichloroethane	*	75.6	76.0	126.3	2.9	30.0
Trichloroethene		93.3	79.7	124.2	7.6	30.0
1,2-Dichloropropane		95.8	78.6	126.4	4.5	30.0
Bromodichloromethane		90.1	80.4	128.2	4.2	30.0
Dibromomethane		94.3	76.9	122.1	2.4	30.0
cis-1,3-Dichloropropene		100.2	79.8	129.9	3.1	30.0
Toluene		94.2	79.8	124.5	6.8	30.0
trans-1,3-Dichloropropene		96.8	74.0	131.3	2.3	30.0
1,1,2-Trichloroethane		99.1	78.7	123.1	0.1	30.0
Tetrachloroethene		92.6	74.5	124.5	8.1	30.0
trans-1,4-Dichloro-2-butene		90.2	68.6	135.4	2.1	30.0
Dibromochloromethane		102.4	74.6	127.2	1.9	30.0
1,2-Dibromoethane		104.8	70.3	133.7	0.8	30.0
Chlorobenzene		101.2	79.2	122.7	6.7	30.0

Organics - Volatiles, Prep Batch ID: VF230523W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230523A3.LCSDW23A, Parent Sample ID: 230523A3.LCSW23A

Run in Batch: 230523A3, Run Date: 05/23/2023 13:04, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.4	80.3	128.2	3.8	30.0
Ethylbenzene		99.9	79.5	129.1	7.8	30.0
p,m-Xylene		98.4	79.4	132.2	7.0	30.0
o-Xylene		97.9	80.2	131.0	6.2	30.0
Styrene		99.9	69.5	126.7	5.9	30.0
Isopropylbenzene		99.2	74.4	121.5	7.3	30.0
Bromoform		103.5	69.4	128.0	0.6	30.0
1,1,2,2-Tetrachloroethane		109.0	79.8	126.3	2.4	30.0
1,2,3-Trichloropropane		98.1	78.3	138.8	1.4	30.0
n-Propylbenzene		100.8	82.0	130.7	7.2	30.0
Bromobenzene		96.3	78.7	124.6	5.3	30.0
1,3,5-Trimethylbenzene		98.9	81.3	128.9	5.5	30.0
tert-Butylbenzene		90.6	80.7	128.9	6.1	30.0
1,2,4-Trimethylbenzene		97.7	81.4	130.8	5.5	30.0
sec-Butylbenzene		102.2	77.4	129.8	8.6	30.0
p-Isopropyltoluene		99.7	79.8	137.5	9.7	30.0
1,3-Dichlorobenzene		97.4	77.0	131.3	7.5	30.0
1,4-Dichlorobenzene		98.2	20.7	137.7	7.5	30.0
1,2-Dichlorobenzene		98.8	10.0	166.2	6.4	30.0
1,2,3-Trimethylbenzene		98.9	76.3	124.2	7.5	30.0
n-Butylbenzene		101.8	80.0	133.3	7.9	30.0
Hexachloroethane		107.0	23.8	138.1	8.9	30.0
1,2-Dibromo-3-chloropropane		109.0	21.2	189.4	4.7	30.0
1,2,4-Trichlorobenzene		105.2	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		104.1	75.4	131.4	0.8	30.0
Naphthalene		108.0	32.9	135.8	3.8	30.0
2-Methylnaphthalene		106.4	25.5	165.5	7.8	30.0

Organics - Volatiles, Prep Batch ID: VS230523W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.77	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.1	70.0	130.0	3.3	30.0

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.28	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		123.9	70.0	130.0	16.5	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48713
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing
Submitted: 05/17/2023 16:50 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152804

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470A / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jackie Schulte

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☑ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS
48713.01	5/16/23	1420	MW-21-139_051623		3		3						3	
.02	5/16/23	[redacted]	DUP-01_051623		3		3						3	
.03	5/16/23	1630	MW-14-58R_051623		3		3						3	3
.04	5/17/23	0935	MW-22-156_051723		3		3						3	3
.05	5/17/23	1100	MW-22-153_051723		3		3						3	3
.06	5/17/23	1306	MW-22-155_051723		3		3						3	3
.07	5/17/23	1510	MW-22-157_051723		3		3						3	
.08	5/16/23	—	Trip Blank		1		1							1

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler Arcadis — DATE 5/17/23 TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION Johanna Murray — DATE 5/17/23 TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS
SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS

NOTES: TEMP. ON ARRIVAL 3.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48714.01(01)+QC01
Generated on 05/26/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48714.01-S48714.23
Project: 30171056.0470B / RACER Lansing
Collected Date(s): 05/16/2023 - 05/17/2023
Submitted Date/Time: 05/17/2023 16:50
Sampled by: A Westhuis/D Richmond/B Cobern
P.O. #: US3460008097

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1 (1993)
N/A	Not Applicable
SM4500-N/NH3 G	Standard Method 4500 N(org)B / 4500 NH3 G 2017
SM4500-PE	Standard Method 4500 P E 2011 / 4500 P B(5) 2011
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (23 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48714.01	MW-13-43_051623	Groundwater	05/16/23 14:40
S48714.02	MW-13-45_051623	Groundwater	05/16/23 16:30
S48714.03	MW-15-72_051723	Groundwater	05/17/23 10:50
S48714.04	MW-16-78_051723	Groundwater	05/17/23 11:50
S48714.05	MW-16-82_051723	Groundwater	05/17/23 12:45
S48714.06	MW-19-115_051723	Groundwater	05/17/23 14:05
S48714.07	MW-19-116_051723	Groundwater	05/17/23 15:25
S48714.08	MW-16-75_051623	Groundwater	05/16/23 14:00
S48714.09	MW-16-77_051723	Groundwater	05/17/23 09:15
S48714.10	MW-16-74_051723	Groundwater	05/17/23 11:00
S48714.11	MW-16-81_051723	Groundwater	05/17/23 12:05
S48714.12	MW-16-84_051723	Groundwater	05/17/23 13:55
S48714.13	MW-17-86_051723	Groundwater	05/17/23 15:40
S48714.14	MW-17-86_051723 MS	Groundwater	05/17/23 15:40
S48714.15	MW-17-86_051723 MSD	Groundwater	05/17/23 15:40
S48714.16	MW-19-123_051723	Groundwater	05/17/23 09:25
S48714.17	MW-19-121_051723	Groundwater	05/17/23 10:50
S48714.18	MW-14-61_051723	Groundwater	05/17/23 12:20
S48714.19	MW-20-128_051723	Groundwater	05/17/23 13:30
S48714.20	MW-20-127_051723	Groundwater	05/17/23 14:40
S48714.21	TW-15-12_051723	Groundwater	05/17/23 15:50
S48714.22	Trip Blank	Water	05/16/23 00:01
S48714.23	DUP-02_051723	Groundwater	05/17/23 00:01

Analytical Laboratory Report

Lab Sample ID: S48714.01
Sample Tag: MW-13-43_051623
Collected Date/Time: 05/16/2023 14:40
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 17:10, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.02
Sample Tag: MW-13-45_051623
Collected Date/Time: 05/16/2023 16:30
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 17:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.03
Sample Tag: MW-15-72_051723
Collected Date/Time: 05/17/2023 10:50
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 17:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	199	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.04
Sample Tag: MW-16-78_051723
Collected Date/Time: 05/17/2023 11:50
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 15:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.05
Sample Tag: MW-16-82_051723
Collected Date/Time: 05/17/2023 12:45
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 15:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.06
Sample Tag: MW-19-115_051723
Collected Date/Time: 05/17/2023 14:05
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 19:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.07
Sample Tag: MW-19-116_051723
Collected Date/Time: 05/17/2023 15:25
Matrix: Groundwater
COC Reference: 152801

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 19:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	81	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.08
Sample Tag: MW-16-75_051623
Collected Date/Time: 05/16/2023 14:00
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 16:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.09
Sample Tag: MW-16-77_051723
Collected Date/Time: 05/17/2023 09:15
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 17:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.10
Sample Tag: MW-16-74_051723
Collected Date/Time: 05/17/2023 11:00
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 20:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S48714.11
Sample Tag: MW-16-81_051723
Collected Date/Time: 05/17/2023 12:05
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 20:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	168	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48714.11 (continued)
Sample Tag: MW-16-81_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:20, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48714.12
Sample Tag: MW-16-84_051723
Collected Date/Time: 05/17/2023 13:55
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 21:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	44	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48714.12 (continued)
Sample Tag: MW-16-84_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:40, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48714.13
Sample Tag: MW-17-86_051723
Collected Date/Time: 05/17/2023 15:40
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 02:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	20	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48714.13 (continued)
Sample Tag: MW-17-86_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 18:59, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48714.14
Sample Tag: MW-17-86_051723 MS
Collected Date/Time: 05/17/2023 15:40
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 00:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 21:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	57	10		ug/L	1	60-29-7	1
Acetone	62	50		ug/L	1	67-64-1	1
Methyl iodide	58	1		ug/L	1	74-88-4	1
Carbon disulfide	59	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	59	5		ug/L	1	1634-04-4	1
Acrylonitrile	58	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	59	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	59	5		ug/L	1	75-71-8	1
Chloromethane	55	5		ug/L	1	74-87-3	1
Vinyl chloride	57	1		ug/L	1	75-01-4	1
Bromomethane	55	5		ug/L	1	74-83-9	1
Chloroethane	54	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	58	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	58	1		ug/L	1	75-35-4	1
Methylene chloride	56	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	56	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	56	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	56	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	56	1		ug/L	1	67-66-3	1
Bromochloromethane	57	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	55	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	59	50		ug/L	1	108-10-1	1
2-Hexanone	61	50		ug/L	1	591-78-6	1
Carbon tetrachloride	57	1		ug/L	1	56-23-5	1
Benzene	55	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	55	1		ug/L	1	107-06-2	1
Trichloroethene	55	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	56	1		ug/L	1	78-87-5	1
Bromodichloromethane	55	1		ug/L	1	75-27-4	1
Dibromomethane	55	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	56	1		ug/L	1	10061-01-5	1

1-Spiked at 50ug/L

Lab Sample ID: S48714.14 (continued)
Sample Tag: MW-17-86_051723 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 21:15, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	55	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	56	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	56	1		ug/L	1	79-00-5	1
Tetrachloroethene	55	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	55	1		ug/L	1	110-57-6	1
Dibromochloromethane	55	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	54	1		ug/L	1	106-93-4	1
Chlorobenzene	53	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	54	1		ug/L	1	630-20-6	1
Ethylbenzene	54	1		ug/L	1	100-41-4	1
p,m-Xylene*	109	2		ug/L	1		1
o-Xylene	54	1		ug/L	1	95-47-6	1
Styrene	55	1		ug/L	1	100-42-5	1
Isopropylbenzene	55	5		ug/L	1	98-82-8	1
Bromoform	55	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	55	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	54	1		ug/L	1	96-18-4	1
n-Propylbenzene	55	1		ug/L	1	103-65-1	1
Bromobenzene	55	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	54	1		ug/L	1	108-67-8	1
tert-Butylbenzene	54	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	56	1		ug/L	1	95-63-6	1
sec-Butylbenzene	53	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	52	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	52	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	52	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	53	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	53	1		ug/L	1	526-73-8	1
n-Butylbenzene	50	1		ug/L	1	104-51-8	1
Hexachloroethane	52	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	54	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	51	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	51	5		ug/L	1	87-61-6	1
Naphthalene	54	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	53	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S48714.15
Sample Tag: MW-17-86_051723 MSD
Collected Date/Time: 05/17/2023 15:40
Matrix: Groundwater
COC Reference: 152802

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 00:21, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	77	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 21:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	54	10		ug/L	1	60-29-7	1
Acetone	60	50		ug/L	1	67-64-1	1
Methyl iodide	56	1		ug/L	1	74-88-4	1
Carbon disulfide	57	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	57	5		ug/L	1	1634-04-4	1
Acrylonitrile	56	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	55	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	53	5		ug/L	1	75-71-8	1
Chloromethane	54	5		ug/L	1	74-87-3	1
Vinyl chloride	55	1		ug/L	1	75-01-4	1
Bromomethane	53	5		ug/L	1	74-83-9	1
Chloroethane	53	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	55	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	57	1		ug/L	1	75-35-4	1
Methylene chloride	55	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	55	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	55	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	55	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	55	1		ug/L	1	67-66-3	1
Bromochloromethane	55	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	55	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	57	50		ug/L	1	108-10-1	1
2-Hexanone	58	50		ug/L	1	591-78-6	1
Carbon tetrachloride	56	1		ug/L	1	56-23-5	1
Benzene	54	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	53	1		ug/L	1	107-06-2	1
Trichloroethene	55	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	54	1		ug/L	1	78-87-5	1
Bromodichloromethane	54	1		ug/L	1	75-27-4	1
Dibromomethane	55	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	54	1		ug/L	1	10061-01-5	1

1-Spiked at 50ug/L

Lab Sample ID: S48714.15 (continued)
Sample Tag: MW-17-86_051723 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 21:34, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	55	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	55	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	54	1		ug/L	1	79-00-5	1
Tetrachloroethene	54	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	53	1		ug/L	1	110-57-6	1
Dibromochloromethane	53	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	54	1		ug/L	1	106-93-4	1
Chlorobenzene	53	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	54	1		ug/L	1	630-20-6	1
Ethylbenzene	54	1		ug/L	1	100-41-4	1
p,m-Xylene*	108	2		ug/L	1		1
o-Xylene	54	1		ug/L	1	95-47-6	1
Styrene	54	1		ug/L	1	100-42-5	1
Isopropylbenzene	55	5		ug/L	1	98-82-8	1
Bromoform	53	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	56	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	52	1		ug/L	1	96-18-4	1
n-Propylbenzene	54	1		ug/L	1	103-65-1	1
Bromobenzene	54	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	54	1		ug/L	1	108-67-8	1
tert-Butylbenzene	54	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	56	1		ug/L	1	95-63-6	1
sec-Butylbenzene	54	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	53	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	52	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	52	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	53	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	53	1		ug/L	1	526-73-8	1
n-Butylbenzene	52	1		ug/L	1	104-51-8	1
Hexachloroethane	53	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	54	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	52	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	53	5		ug/L	1	87-61-6	1
Naphthalene	54	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	55	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S48714.16
Sample Tag: MW-19-123_051723
Collected Date/Time: 05/17/2023 09:25
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 11:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:41, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.228	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 12:38, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.07	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/23/23 21:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	44	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.17
Sample Tag: MW-19-121_051723
Collected Date/Time: 05/17/2023 10:50
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 11:50, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	5.4	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:47, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.452	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 12:43, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	4.8	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 02:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48714.18
Sample Tag: MW-14-61_051723
Collected Date/Time: 05/17/2023 12:20
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/23/23 11:00	BDO	

Inorganics

Method: E300.0, Run Date: 05/18/23 12:00, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:49, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.168	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 12:47, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.07	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 03:10, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	13	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 19:18, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	

Lab Sample ID: S48714.18 (continued)
Sample Tag: MW-14-61_051723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/22/23 19:18, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S48714.19
Sample Tag: MW-20-128_051723
Collected Date/Time: 05/17/2023 13:30
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 12:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:51, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.808	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 12:53, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.33	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 03:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.20
Sample Tag: MW-20-127_051723
Collected Date/Time: 05/17/2023 14:40
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 12:20, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:53, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.752	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 12:58, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.06	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 03:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	155	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.21
Sample Tag: TW-15-12_051723
Collected Date/Time: 05/17/2023 15:50
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 12:30, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:55, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.304	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 16:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.12	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 18:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48714.22
Sample Tag: Trip Blank
Collected Date/Time: 05/16/2023 00:01
Matrix: Water
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	n/a	n/a	No	n/a	n/a

Other / Misc.

Method: , Run Date: 05/22/23 10:00, Analyst: JRM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
No Analyses*	Completed				1		

Analytical Laboratory Report

Lab Sample ID: S48714.23
Sample Tag: DUP-02_051723
Collected Date/Time: 05/17/2023 00:01
Matrix: Groundwater
COC Reference: 152803

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.1	IR
1	125ml Plastic	None	Yes	3.1	IR
1	250ml Plastic	H2SO4	Yes	3.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Inorganics

Method: E300.0, Run Date: 05/18/23 12:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	5.6	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 16:57, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.324	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/23/23 16:45, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	5.1	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 18:24, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48714.01(01)+QC01
Generated on 05/26/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48714.01-S48714.21, S48714.23
Project: 30171056.0470B / RACER Lansing
Submitted Date/Time: 05/17/2023 16:50
Sampled by: A Westhuis/D Richmond/B Cobern
P.O. #: US3460008097

QC Report Sections

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Analysis Summary (Pages 36-57)
Prep Batch Summary (Pages 58-59)
Surrogates per Lab Sample (Pages 60-63)
Surrogates per QC Sample (Pages 64-68)
Internal Standards per Lab Sample (Pages 69-88)
Internal Standards per QC Sample (Pages 89-93)
Batch QC Results (Pages 94-107)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48714.01
Sample Tag: MW-13-43_051623
Collected Date/Time: 05/16/2023 14:40
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 17:10	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.02
Sample Tag: MW-13-45_051623
Collected Date/Time: 05/16/2023 16:30
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 17:32	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.03
Sample Tag: MW-15-72_051723
Collected Date/Time: 05/17/2023 10:50
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 17:54	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.04
Sample Tag: MW-16-78_051723
Collected Date/Time: 05/17/2023 11:50
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 15:15	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.05
Sample Tag: MW-16-82_051723
Collected Date/Time: 05/17/2023 12:45
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 15:38	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.06
Sample Tag: MW-19-115_051723
Collected Date/Time: 05/17/2023 14:05
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 19:01	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.07
Sample Tag: MW-19-116_051723
Collected Date/Time: 05/17/2023 15:25
Matrix: Groundwater
COC Reference: 152801

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 19:22	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.08
Sample Tag: MW-16-75_051623
Collected Date/Time: 05/16/2023 14:00
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 16:00	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.09
Sample Tag: MW-16-77_051723
Collected Date/Time: 05/17/2023 09:15
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 17:40	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.10
Sample Tag: MW-16-74_051723
Collected Date/Time: 05/17/2023 11:00
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 20:28	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.11
Sample Tag: MW-16-81_051723
Collected Date/Time: 05/17/2023 12:05
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 20:49	230523A9	VS230523W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:20	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.12
Sample Tag: MW-16-84_051723
Collected Date/Time: 05/17/2023 13:55
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 21:12	230523A9	VS230523W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:40	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.13
Sample Tag: MW-17-86_051723
Collected Date/Time: 05/17/2023 15:40
Matrix: Groundwater
COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 02:27	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:59	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.14

Sample Tag: MW-17-86_051723 MS

Collected Date/Time: 05/17/2023 15:40

Matrix: Groundwater

COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 00:00	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 21:15	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.15

Sample Tag: MW-17-86_051723 MSD

Collected Date/Time: 05/17/2023 15:40

Matrix: Groundwater

COC Reference: 152802

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 00:21	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 21:34	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.16
Sample Tag: MW-19-123_051723
Collected Date/Time: 05/17/2023 09:25
Matrix: Groundwater
COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 11:40	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:41	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 12:38	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/23/23 21:34	230523A9	VS230523W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.17
Sample Tag: MW-19-121_051723
Collected Date/Time: 05/17/2023 10:50
Matrix: Groundwater
COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 11:50	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:47	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 12:43	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 02:49	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.18

Sample Tag: MW-14-61_051723

Collected Date/Time: 05/17/2023 12:20

Matrix: Groundwater

COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 12:00	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:49	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 12:47	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 03:10	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 19:18	230522A9	VF230522W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.19

Sample Tag: MW-20-128_051723

Collected Date/Time: 05/17/2023 13:30

Matrix: Groundwater

COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 12:10	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:51	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 12:53	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 03:32	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.20
Sample Tag: MW-20-127_051723
Collected Date/Time: 05/17/2023 14:40
Matrix: Groundwater
COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 12:20	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:53	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 12:58	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 03:54	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48714.21
Sample Tag: TW-15-12_051723
Collected Date/Time: 05/17/2023 15:50
Matrix: Groundwater
COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 12:30	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:55	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 16:40	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 18:02	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48714.23

Sample Tag: DUP-02_051723

Collected Date/Time: 05/17/2023 00:01

Matrix: Groundwater

COC Reference: 152803

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/18/23 12:40	NTRA230518-W1-A	NTRA230518-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:57	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/23/23 16:45	PHS230523QC	PHS230523QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 18:24	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Inorganics, Prep Batch ID: NTRA230518-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.16	Nitrate-N	E300.0	05/18/23 11:40	NTRA230518-W1-A
S48714.17	Nitrate-N	E300.0	05/18/23 11:50	NTRA230518-W1-A
S48714.18	Nitrate-N	E300.0	05/18/23 12:00	NTRA230518-W1-A
S48714.19	Nitrate-N	E300.0	05/18/23 12:10	NTRA230518-W1-A
S48714.20	Nitrate-N	E300.0	05/18/23 12:20	NTRA230518-W1-A
S48714.21	Nitrate-N	E300.0	05/18/23 12:30	NTRA230518-W1-A
S48714.23	Nitrate-N	E300.0	05/18/23 12:40	NTRA230518-W1-A

Inorganics, Prep Batch ID: PHS230523QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.16	Total Phosphorus	SM4500-PE	05/23/23 12:38	PHS230523QC
S48714.17	Total Phosphorus	SM4500-PE	05/23/23 12:43	PHS230523QC
S48714.18	Total Phosphorus	SM4500-PE	05/23/23 12:47	PHS230523QC
S48714.19	Total Phosphorus	SM4500-PE	05/23/23 12:53	PHS230523QC
S48714.20	Total Phosphorus	SM4500-PE	05/23/23 12:58	PHS230523QC
S48714.21	Total Phosphorus	SM4500-PE	05/23/23 16:40	PHS230523QC
S48714.23	Total Phosphorus	SM4500-PE	05/23/23 16:45	PHS230523QC

Inorganics, Prep Batch ID: TKN230525A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.16	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:41	TKN230525A
S48714.17	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:47	TKN230525A
S48714.18	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:49	TKN230525A
S48714.19	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:51	TKN230525A
S48714.20	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:53	TKN230525A
S48714.21	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:55	TKN230525A
S48714.23	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 16:57	TKN230525A

Organics - Volatiles, Prep Batch ID: VF230522W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.11	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:20	230522A9
S48714.12	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:40	230522A9
S48714.13	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 18:59	230522A9
S48714.14	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 21:15	230522A9
S48714.15	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 21:34	230522A9
S48714.18	Volatile Organics - DEQ List	SW5030C/8260C	05/22/23 19:18	230522A9

Organics - Volatiles, Prep Batch ID: VS230523W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.01	1,4-Dioxane	SW8260B - SIM	05/23/23 17:10	230523A9
S48714.02	1,4-Dioxane	SW8260B - SIM	05/23/23 17:32	230523A9
S48714.03	1,4-Dioxane	SW8260B - SIM	05/23/23 17:54	230523A9
S48714.06	1,4-Dioxane	SW8260B - SIM	05/23/23 19:01	230523A9
S48714.07	1,4-Dioxane	SW8260B - SIM	05/23/23 19:22	230523A9
S48714.10	1,4-Dioxane	SW8260B - SIM	05/23/23 20:28	230523A9
S48714.11	1,4-Dioxane	SW8260B - SIM	05/23/23 20:49	230523A9

Organics - Volatiles, Prep Batch ID: VS230523W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.12	1,4-Dioxane	SW8260B - SIM	05/23/23 21:12	230523A9
S48714.16	1,4-Dioxane	SW8260B - SIM	05/23/23 21:34	230523A9

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.13	1,4-Dioxane	SW8260B - SIM	05/24/23 02:27	230523B9
S48714.14	1,4-Dioxane	SW8260B - SIM	05/24/23 00:00	230523B9
S48714.15	1,4-Dioxane	SW8260B - SIM	05/24/23 00:21	230523B9
S48714.17	1,4-Dioxane	SW8260B - SIM	05/24/23 02:49	230523B9
S48714.18	1,4-Dioxane	SW8260B - SIM	05/24/23 03:10	230523B9
S48714.19	1,4-Dioxane	SW8260B - SIM	05/24/23 03:32	230523B9
S48714.20	1,4-Dioxane	SW8260B - SIM	05/24/23 03:54	230523B9

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48714.04	1,4-Dioxane	SW8260B - SIM	05/24/23 15:15	230524A9
S48714.05	1,4-Dioxane	SW8260B - SIM	05/24/23 15:38	230524A9
S48714.08	1,4-Dioxane	SW8260B - SIM	05/24/23 16:00	230524A9
S48714.09	1,4-Dioxane	SW8260B - SIM	05/24/23 17:40	230524A9
S48714.21	1,4-Dioxane	SW8260B - SIM	05/24/23 18:02	230524A9
S48714.23	1,4-Dioxane	SW8260B - SIM	05/24/23 18:24	230524A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48714.11

Sample Tag: MW-16-81_051723

Collected Date/Time: 05/17/2023 12:05

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:20, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.3**	80.0	124.0
1,2-Dichloroethane-D4		**117.4**	72.0	125.0
Toluene-D8		**102.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48714.12

Sample Tag: MW-16-84_051723

Collected Date/Time: 05/17/2023 13:55

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:40, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.4**	80.0	124.0
1,2-Dichloroethane-D4		**120.9**	72.0	125.0
Toluene-D8		**102.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48714.13

Sample Tag: MW-17-86_051723

Collected Date/Time: 05/17/2023 15:40

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**92.9**	80.0	124.0
1,2-Dichloroethane-D4		**114.4**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48714.18

Sample Tag: MW-14-61_051723

Collected Date/Time: 05/17/2023 12:20

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 19:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.2**	80.0	124.0
1,2-Dichloroethane-D4		**120.2**	72.0	125.0
Toluene-D8		**102.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230522W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**93.0**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**99.5**	89.0	112.0

Blank (BLK)

Lab Sample ID: 230522B9.BLKW22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**102.7**	86.0	118.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.7**	80.0	124.0
1,2-Dichloroethane-D4		**100.4**	72.0	125.0
Toluene-D8		**99.6**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:08, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**104.1**	86.0	118.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.2**	80.0	124.0
1,2-Dichloroethane-D4		**97.0**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522B9.LCSDG22A, Parent Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:27, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		**103.7**	86.0	118.0

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.6**	80.0	124.0
1,2-Dichloroethane-D4		**107.6**	72.0	125.0
Toluene-D8		**98.9**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.5**	80.0	124.0
1,2-Dichloroethane-D4		**102.4**	72.0	125.0
Toluene-D8		**100.9**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230523W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.01

Sample Tag: MW-13-43_051623

Collected Date/Time: 05/16/2023 14:40

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 17:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**114.5**	50.0	200.0

Lab Sample ID: S48714.02

Sample Tag: MW-13-45_051623

Collected Date/Time: 05/16/2023 16:30

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 17:32, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**108.6**	50.0	200.0

Lab Sample ID: S48714.03

Sample Tag: MW-15-72_051723

Collected Date/Time: 05/17/2023 10:50

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 17:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**108.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.04

Sample Tag: MW-16-78_051723

Collected Date/Time: 05/17/2023 11:50

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 15:15, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.05

Sample Tag: MW-16-82_051723

Collected Date/Time: 05/17/2023 12:45

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 15:38, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**89.1**	50.0	200.0

Lab Sample ID: S48714.06

Sample Tag: MW-19-115_051723

Collected Date/Time: 05/17/2023 14:05

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 19:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.07

Sample Tag: MW-19-116_051723

Collected Date/Time: 05/17/2023 15:25

Matrix: Groundwater

COC Reference: 152801

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 19:22, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**112.9**	50.0	200.0

Lab Sample ID: S48714.08

Sample Tag: MW-16-75_051623

Collected Date/Time: 05/16/2023 14:00

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 16:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.09

Sample Tag: MW-16-77_051723

Collected Date/Time: 05/17/2023 09:15

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 17:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**78.4**	50.0	200.0

Lab Sample ID: S48714.10

Sample Tag: MW-16-74_051723

Collected Date/Time: 05/17/2023 11:00

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 20:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.7**	50.0	200.0

Lab Sample ID: S48714.11

Sample Tag: MW-16-81_051723

Collected Date/Time: 05/17/2023 12:05

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 20:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**107.6**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**85.5**	50.0	200.0
1,4-Difluorobenzene		**90.3**	50.0	200.0
Chlorobenzene-D5		**91.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**83.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.12

Sample Tag: MW-16-84_051723

Collected Date/Time: 05/17/2023 13:55

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 21:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**108.0**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**83.9**	50.0	200.0
1,4-Difluorobenzene		**90.0**	50.0	200.0
Chlorobenzene-D5		**93.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**85.3**	50.0	200.0

Lab Sample ID: S48714.13

Sample Tag: MW-17-86_051723

Collected Date/Time: 05/17/2023 15:40

Matrix: Groundwater

COC Reference: 152802

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 02:27, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 18:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**86.8**	50.0	200.0
1,4-Difluorobenzene		**91.1**	50.0	200.0
Chlorobenzene-D5		**91.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**81.5**	50.0	200.0

Lab Sample ID: S48714.16

Sample Tag: MW-19-123_051723

Collected Date/Time: 05/17/2023 09:25

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523A9, Run Date: 05/23/2023 21:34, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**112.1**	50.0	200.0

Lab Sample ID: S48714.17

Sample Tag: MW-19-121_051723

Collected Date/Time: 05/17/2023 10:50

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 02:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.18

Sample Tag: MW-14-61_051723

Collected Date/Time: 05/17/2023 12:20

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 03:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.8**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230522A9, Run Date: 05/22/2023 19:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**87.4**	50.0	200.0
1,4-Difluorobenzene		**93.2**	50.0	200.0
Chlorobenzene-D5		**94.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.19

Sample Tag: MW-20-128_051723

Collected Date/Time: 05/17/2023 13:30

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 03:32, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.20

Sample Tag: MW-20-127_051723

Collected Date/Time: 05/17/2023 14:40

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 03:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**105.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48714.21

Sample Tag: TW-15-12_051723

Collected Date/Time: 05/17/2023 15:50

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 18:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**88.4**	50.0	200.0

Lab Sample ID: S48714.23

Sample Tag: DUP-02_051723

Collected Date/Time: 05/17/2023 00:01

Matrix: Groundwater

COC Reference: 152803

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 18:24, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**82.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230522W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.6**	50.0	200.0
1,4-Difluorobenzene		**97.3**	50.0	200.0
Chlorobenzene-D5		**95.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**84.0**	50.0	200.0

Blank (BLK)

Lab Sample ID: 230522B9.BLKW22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**93.6**	50.0	200.0
Chlorobenzene-D5		**91.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**105.6**	50.0	200.0
1,4-Difluorobenzene		**105.9**	50.0	200.0
Chlorobenzene-D5		**104.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**105.0**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:08, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**94.7**	50.0	200.0
Chlorobenzene-D5		**93.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**102.1**	50.0	200.0
1,4-Difluorobenzene		**101.5**	50.0	200.0
Chlorobenzene-D5		**98.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.9**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522B9.LCSDG22A, Parent Sample ID: 230522B9.LCSG22A

Run in Batch: 230522B9, Run Date: 05/22/2023 14:27, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		**97.7**	50.0	200.0
Chlorobenzene-D5		**96.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.5**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.3**	50.0	200.0
1,4-Difluorobenzene		**99.5**	50.0	200.0
Chlorobenzene-D5		**101.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.7**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.9**	50.0	200.0
1,4-Difluorobenzene		**100.6**	50.0	200.0
Chlorobenzene-D5		**101.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230523W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**109.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**106.7**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

Inorganics, Prep Batch ID: NTRA230518-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA230518-W1-A.LRB1

Run in Batch: NTRA230518-W1-A, Run Date: 05/18/2023 11:08, Prep Date: 05/18/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA230518-W1-A.LCS1

Run in Batch: NTRA230518-W1-A, Run Date: 05/18/2023 11:30, Prep Date: 05/18/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		94	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA230518-W1-A.MS1, Parent Sample ID: S48714.17

Run in Batch: NTRA230518-W1-A, Run Date: 05/18/2023 13:00, Prep Date: 05/18/2023, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		107	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA230518-W1-A.MSD1, Parent Sample ID: NTRA230518-W1-A.MS1

Run in Batch: NTRA230518-W1-A, Run Date: 05/18/2023 13:10, Prep Date: 05/18/2023, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		108	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA230518-W1-A.DP1, Parent Sample ID: S48714.17

Run in Batch: NTRA230518-W1-A, Run Date: 05/18/2023 12:50, Prep Date: 05/18/2023, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		1	15

Inorganics, Prep Batch ID: PHS230523QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS230523QC.LRB1

Run in Batch: PHS230523QC, Run Date: 05/23/2023 11:54, Prep Date: 05/23/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS230523QC.LRB2

Run in Batch: PHS230523QC, Run Date: 05/23/2023 12:01, Prep Date: 05/23/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS230523QC.LCS1

Run in Batch: PHS230523QC, Run Date: 05/23/2023 12:08, Prep Date: 05/23/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		96	90	110

Matrix Spike (MS)

Lab Sample ID: PHS230523QC.MS1, Parent Sample ID: S48668.06

Run in Batch: PHS230523QC, Run Date: 05/23/2023 17:47, Prep Date: 05/23/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		92	80	120

Duplicate (DUP)

Lab Sample ID: PHS230523QC.DP1, Parent Sample ID: S48798.02

Run in Batch: PHS230523QC, Run Date: 05/23/2023 17:42, Prep Date: 05/23/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		2.7	20

Inorganics, Prep Batch ID: TKN230525A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: TKN230525A.LRB1

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:11, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.025	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN230525A.LCS1

Run in Batch: TKN230525A, Run Date: 05/25/2023 15:51, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		102.0	90	110

Matrix Spike (MS)

Lab Sample ID: TKN230525A.MS1, Parent Sample ID: S48714.16

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:43, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		101.3	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: TKN230525A.MSD1, Parent Sample ID: TKN230525A.MS1

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:45, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Total Kjeldahl Nitrogen		99.8	80	120	1	15

Duplicate (DUP)

Lab Sample ID: TKN230525A.DP1, Parent Sample ID: S48879.03

Run in Batch: TKN230525A, Run Date: 05/25/2023 17:15, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 20

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.3	20

Organics - Volatiles, Prep Batch ID: VF230522W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 230522A9.BLKW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 14:47, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		113.3	67.4	121.2
Acetone		113.3	29.9	161.5
Methyl iodide	*	117.6	68.8	116.4
Carbon disulfide		120.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		117.9	73.2	122.4
Acrylonitrile		110.6	69.9	128.9
2-Butanone (MEK)		109.9	44.0	134.4
Dichlorodifluoromethane		108.2	10.0	222.8
Chloromethane		114.7	23.8	166.5
Vinyl chloride		113.0	43.5	149.1
Bromomethane		113.2	56.8	151.3
Chloroethane		109.5	53.4	149.4
Trichlorofluoromethane		111.2	59.7	151.8
1,1-Dichloroethene		117.7	69.6	139.4
Methylene chloride		112.7	73.3	121.1
trans-1,2-Dichloroethene		115.5	73.6	129.3
1,1-Dichloroethane		114.3	71.5	126.2
cis-1,2-Dichloroethene		113.1	76.6	122.1
Tetrahydrofuran		107.4	59.0	117.9
Chloroform		113.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		112.8	78.2	120.8
1,1,1-Trichloroethane		114.3	79.4	130.9
4-Methyl-2-pentanone (MIBK)		116.3	71.6	125.2
2-Hexanone		119.5	55.4	136.9
Carbon tetrachloride		113.7	72.6	133.0
Benzene		112.2	79.9	124.9
1,2-Dichloroethane		109.9	76.0	126.3
Trichloroethene		113.3	79.7	124.2
1,2-Dichloropropane		111.5	78.6	126.4
Bromodichloromethane		110.4	80.4	128.2
Dibromomethane		109.4	76.9	122.1
cis-1,3-Dichloropropene		115.5	79.8	129.9
Toluene		113.9	79.8	124.5
trans-1,3-Dichloropropene		114.9	74.0	131.3
1,1,2-Trichloroethane		108.9	78.7	123.1
Tetrachloroethene		114.2	74.5	124.5
trans-1,4-Dichloro-2-butene		118.7	68.6	135.4
Dibromochloromethane		112.2	74.6	127.2
1,2-Dibromoethane		112.0	70.3	133.7
Chlorobenzene		112.5	79.2	122.7
1,1,1,2-Tetrachloroethane		115.5	80.3	128.2
Ethylbenzene		115.1	79.5	129.1
p,m-Xylene		116.3	79.4	132.2
o-Xylene		115.7	80.2	131.0
Styrene		114.9	69.5	126.7
Isopropylbenzene		117.4	74.4	121.5
Bromoform		113.3	69.4	128.0
1,1,2,2-Tetrachloroethane		114.4	79.8	126.3
1,2,3-Trichloropropane		108.4	78.3	138.8
n-Propylbenzene		116.8	82.0	130.7
Bromobenzene		114.2	78.7	124.6
1,3,5-Trimethylbenzene		116.1	81.3	128.9
tert-Butylbenzene		116.8	80.7	128.9
1,2,4-Trimethylbenzene		119.6	81.4	130.8
sec-Butylbenzene		115.9	77.4	129.8
p-Isopropyltoluene		115.6	79.8	137.5
1,3-Dichlorobenzene		113.1	77.0	131.3
1,4-Dichlorobenzene		113.8	20.7	137.7
1,2-Dichlorobenzene		113.3	10.0	166.2
1,2,3-Trimethylbenzene		114.6	76.3	124.2
n-Butylbenzene		115.6	80.0	133.3
Hexachloroethane		118.7	23.8	138.1
1,2-Dibromo-3-chloropropane		113.3	21.2	189.4
1,2,4-Trichlorobenzene		114.3	27.4	143.4
1,2,3-Trichlorobenzene		115.3	75.4	131.4
Naphthalene		114.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:10, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		122.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		110.2	67.4	121.2	2.8	30.0
Acetone		112.8	29.9	161.5	0.4	30.0
Methyl iodide		116.2	68.8	116.4	1.2	30.0
Carbon disulfide		118.7	63.8	137.4	1.6	30.0
tert-Methyl butyl ether (MTBE)		117.6	73.2	122.4	0.3	30.0
Acrylonitrile		114.8	69.9	128.9	3.8	30.0
2-Butanone (MEK)		114.7	44.0	134.4	4.2	30.0
Dichlorodifluoromethane		120.1	10.0	222.8	10.4	30.0
Chloromethane		113.2	23.8	166.5	1.2	30.0
Vinyl chloride		113.9	43.5	149.1	0.8	30.0
Bromomethane		110.1	56.8	151.3	2.8	30.0
Chloroethane		107.2	53.4	149.4	2.2	30.0
Trichlorofluoromethane		115.6	59.7	151.8	3.9	30.0
1,1-Dichloroethene		117.1	69.6	139.4	0.6	30.0
Methylene chloride		110.6	73.3	121.1	1.9	30.0
trans-1,2-Dichloroethene		113.4	73.6	129.3	1.9	30.0
1,1-Dichloroethane		112.5	71.5	126.2	1.6	30.0
cis-1,2-Dichloroethene		111.9	76.6	122.1	1.0	30.0
Tetrahydrofuran		111.7	59.0	117.9	3.9	30.0
Chloroform		110.8	78.4	124.0	2.2	30.0
Bromochloromethane		113.2	78.2	120.8	0.3	30.0
1,1,1-Trichloroethane		111.4	79.4	130.9	2.6	30.0
4-Methyl-2-pentanone (MIBK)		118.7	71.6	125.2	2.1	30.0
2-Hexanone		121.8	55.4	136.9	1.9	30.0
Carbon tetrachloride		115.7	72.6	133.0	1.7	30.0
Benzene		110.4	79.9	124.9	1.7	30.0
1,2-Dichloroethane		108.1	76.0	126.3	1.6	30.0
Trichloroethene		113.2	79.7	124.2	0.1	30.0
1,2-Dichloropropane		110.8	78.6	126.4	0.6	30.0
Bromodichloromethane		110.3	80.4	128.2	0.1	30.0
Dibromomethane		109.6	76.9	122.1	0.2	30.0
cis-1,3-Dichloropropene		111.9	79.8	129.9	3.2	30.0
Toluene		111.5	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		113.6	74.0	131.3	1.1	30.0
1,1,2-Trichloroethane		109.7	78.7	123.1	0.7	30.0
Tetrachloroethene		113.0	74.5	124.5	1.1	30.0
trans-1,4-Dichloro-2-butene		121.1	68.6	135.4	2.0	30.0
Dibromochloromethane		113.9	74.6	127.2	1.5	30.0
1,2-Dibromoethane		114.0	70.3	133.7	1.7	30.0
Chlorobenzene		111.4	79.2	122.7	1.0	30.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230522A9.LCSDW22A, Parent Sample ID: 230522A9.LCSW22A

Run in Batch: 230522A9, Run Date: 05/22/2023 13:29, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		112.5	80.3	128.2	2.6	30.0
Ethylbenzene		113.6	79.5	129.1	1.3	30.0
p,m-Xylene		115.1	79.4	132.2	1.0	30.0
o-Xylene		114.9	80.2	131.0	0.7	30.0
Styrene		114.1	69.5	126.7	0.7	30.0
Isopropylbenzene		116.7	74.4	121.5	0.6	30.0
Bromoform		115.7	69.4	128.0	2.1	30.0
1,1,2,2-Tetrachloroethane		117.3	79.8	126.3	2.6	30.0
1,2,3-Trichloropropane		111.5	78.3	138.8	2.8	30.0
n-Propylbenzene		116.8	82.0	130.7	0.1	30.0
Bromobenzene		114.5	78.7	124.6	0.3	30.0
1,3,5-Trimethylbenzene		115.8	81.3	128.9	0.3	30.0
tert-Butylbenzene		116.6	80.7	128.9	0.2	30.0
1,2,4-Trimethylbenzene		118.1	81.4	130.8	1.3	30.0
sec-Butylbenzene		117.4	77.4	129.8	1.3	30.0
p-Isopropyltoluene		117.0	79.8	137.5	1.2	30.0
1,3-Dichlorobenzene		113.1	77.0	131.3	0.0	30.0
1,4-Dichlorobenzene		113.9	20.7	137.7	0.0	30.0
1,2-Dichlorobenzene		114.8	10.0	166.2	1.4	30.0
1,2,3-Trimethylbenzene		114.9	76.3	124.2	0.3	30.0
n-Butylbenzene		115.7	80.0	133.3	0.1	30.0
Hexachloroethane		119.6	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		120.6	21.2	189.4	6.2	30.0
1,2,4-Trichlorobenzene		118.1	27.4	143.4	3.3	30.0
1,2,3-Trichlorobenzene		118.3	75.4	131.4	2.6	30.0
Naphthalene		122.6	32.9	135.8	6.8	30.0
2-Methylnaphthalene		130.2	25.5	165.5	6.5	30.0

Matrix Spike (MS)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		113.9	67.4	121.2
Acetone		115.4	29.9	161.5
Methyl iodide		116.0	68.8	116.4
Carbon disulfide		117.8	63.8	137.4
tert-Methyl butyl ether (MTBE)		117.7	73.2	122.4
Acrylonitrile		115.8	69.9	128.9
2-Butanone (MEK)		117.0	44.0	134.4
Dichlorodifluoromethane		118.0	10.0	222.8
Chloromethane		109.2	23.8	166.5
Vinyl chloride		113.6	43.5	149.1
Bromomethane		109.1	56.8	151.3
Chloroethane		107.3	53.4	149.4
Trichlorofluoromethane		116.2	59.7	151.8
1,1-Dichloroethene		116.6	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		111.5	73.3	121.1
trans-1,2-Dichloroethene		112.1	73.6	129.3
1,1-Dichloroethane		111.8	71.5	126.2
cis-1,2-Dichloroethene		112.1	76.6	122.1
Tetrahydrofuran		108.5	59.0	117.9
Chloroform		112.4	78.4	124.0
Bromochloromethane		114.5	78.2	120.8
1,1,1-Trichloroethane		110.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		118.8	71.6	125.2
2-Hexanone		121.1	55.4	136.9
Carbon tetrachloride		113.3	72.6	133.0
Benzene		110.7	79.9	124.9
1,2-Dichloroethane		109.7	76.0	126.3
Trichloroethene		110.3	79.7	124.2
1,2-Dichloropropane		112.0	78.6	126.4
Bromodichloromethane		110.1	80.4	128.2
Dibromomethane		110.7	76.9	122.1
cis-1,3-Dichloropropene		111.2	79.8	129.9
Toluene		110.0	79.8	124.5
trans-1,3-Dichloropropene		112.9	74.0	131.3
1,1,2-Trichloroethane		112.0	78.7	123.1
Tetrachloroethene		110.3	74.5	124.5
trans-1,4-Dichloro-2-butene		110.3	68.6	135.4
Dibromochloromethane		109.7	74.6	127.2
1,2-Dibromoethane		108.7	70.3	133.7
Chlorobenzene		106.6	79.2	122.7
1,1,1,2-Tetrachloroethane		108.5	80.3	128.2
Ethylbenzene		107.6	79.5	129.1
p,m-Xylene		108.6	79.4	132.2
o-Xylene		108.5	80.2	131.0
Styrene		109.6	69.5	126.7
Isopropylbenzene		109.8	74.4	121.5
Bromoform		109.4	69.4	128.0
1,1,2,2-Tetrachloroethane		110.7	79.8	126.3
1,2,3-Trichloropropane		108.7	78.3	138.8
n-Propylbenzene		109.3	82.0	130.7
Bromobenzene		109.5	78.7	124.6
1,3,5-Trimethylbenzene		108.2	81.3	128.9
tert-Butylbenzene		107.5	80.7	128.9
1,2,4-Trimethylbenzene		111.9	81.4	130.8
sec-Butylbenzene		105.1	77.4	129.8
p-Isopropyltoluene		104.0	79.8	137.5
1,3-Dichlorobenzene		103.1	77.0	131.3
1,4-Dichlorobenzene		104.6	20.7	137.7
1,2-Dichlorobenzene		105.8	10.0	166.2
1,2,3-Trimethylbenzene		105.2	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230522A9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230522A9, Run Date: 05/22/2023 21:15, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		100.4	80.0	133.3
Hexachloroethane		103.4	23.8	138.1
1,2-Dibromo-3-chloropropane		107.3	21.2	189.4
1,2,4-Trichlorobenzene		101.8	27.4	143.4
1,2,3-Trichlorobenzene		102.7	75.4	131.4
Naphthalene		107.5	32.9	135.8
2-Methylnaphthalene		106.2	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		108.4	67.4	121.2	4.9	30.0
Acetone		111.2	29.9	161.5	3.5	30.0
Methyl iodide		113.0	68.8	116.4	2.7	30.0
Carbon disulfide		114.8	63.8	137.4	2.5	30.0
tert-Methyl butyl ether (MTBE)		114.5	73.2	122.4	2.7	30.0
Acrylonitrile		112.0	69.9	128.9	3.3	30.0
2-Butanone (MEK)		109.7	44.0	134.4	6.5	30.0
Dichlorodifluoromethane		106.5	10.0	222.8	10.2	30.0
Chloromethane		108.5	23.8	166.5	0.7	30.0
Vinyl chloride		110.9	43.5	149.1	2.4	30.0
Bromomethane		106.5	56.8	151.3	2.4	30.0
Chloroethane		105.6	53.4	149.4	1.7	30.0
Trichlorofluoromethane		110.2	59.7	151.8	5.3	30.0
1,1-Dichloroethene		113.8	69.6	139.4	2.4	30.0
Methylene chloride		110.2	73.3	121.1	1.2	30.0
trans-1,2-Dichloroethene		110.4	73.6	129.3	1.5	30.0
1,1-Dichloroethane		109.9	71.5	126.2	1.7	30.0
cis-1,2-Dichloroethene		109.1	76.6	122.1	2.7	30.0
Tetrahydrofuran		98.7	59.0	117.9	9.5	30.0
Chloroform		109.6	78.4	124.0	2.5	30.0
Bromochloromethane		110.8	78.2	120.8	3.3	30.0
1,1,1-Trichloroethane		109.6	79.4	130.9	1.2	30.0
4-Methyl-2-pentanone (MIBK)		113.9	71.6	125.2	4.2	30.0
2-Hexanone		116.3	55.4	136.9	4.0	30.0
Carbon tetrachloride		112.9	72.6	133.0	0.3	30.0
Benzene		107.9	79.9	124.9	2.6	30.0
1,2-Dichloroethane		105.9	76.0	126.3	3.5	30.0
Trichloroethene		109.6	79.7	124.2	0.7	30.0
1,2-Dichloropropane		108.8	78.6	126.4	2.8	30.0
Bromodichloromethane		107.3	80.4	128.2	2.5	30.0
Dibromomethane		109.0	76.9	122.1	1.5	30.0
cis-1,3-Dichloropropene		108.4	79.8	129.9	2.6	30.0
Toluene		109.1	79.8	124.5	0.8	30.0
trans-1,3-Dichloropropene		109.5	74.0	131.3	3.0	30.0

Organics - Volatiles, Prep Batch ID: VF230522W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 230522A9.4871415N, Parent Sample ID: 230522A9.4871414M

Run in Batch: 230522A9, Run Date: 05/22/2023 21:34, Prep Date: 05/22/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		108.0	78.7	123.1	3.6	30.0
Tetrachloroethene		108.2	74.5	124.5	1.8	30.0
trans-1,4-Dichloro-2-butene		106.5	68.6	135.4	3.5	30.0
Dibromochloromethane		106.8	74.6	127.2	2.7	30.0
1,2-Dibromoethane		107.9	70.3	133.7	0.8	30.0
Chlorobenzene		105.5	79.2	122.7	1.0	30.0
1,1,1,2-Tetrachloroethane		107.1	80.3	128.2	1.3	30.0
Ethylbenzene		107.0	79.5	129.1	0.5	30.0
p,m-Xylene		107.9	79.4	132.2	0.6	30.0
o-Xylene		108.7	80.2	131.0	0.2	30.0
Styrene		108.4	69.5	126.7	1.1	30.0
Isopropylbenzene		109.2	74.4	121.5	0.6	30.0
Bromoform		106.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		111.7	79.8	126.3	0.9	30.0
1,2,3-Trichloropropane		104.5	78.3	138.8	3.9	30.0
n-Propylbenzene		108.6	82.0	130.7	0.7	30.0
Bromobenzene		108.6	78.7	124.6	0.8	30.0
1,3,5-Trimethylbenzene		108.4	81.3	128.9	0.2	30.0
tert-Butylbenzene		108.7	80.7	128.9	1.1	30.0
1,2,4-Trimethylbenzene		111.7	81.4	130.8	0.2	30.0
sec-Butylbenzene		107.1	77.4	129.8	1.8	30.0
p-Isopropyltoluene		106.7	79.8	137.5	2.5	30.0
1,3-Dichlorobenzene		103.8	77.0	131.3	0.7	30.0
1,4-Dichlorobenzene		104.9	20.7	137.7	0.3	30.0
1,2-Dichlorobenzene		106.6	10.0	166.2	0.8	30.0
1,2,3-Trimethylbenzene		106.1	76.3	124.2	0.9	30.0
n-Butylbenzene		103.4	80.0	133.3	3.0	30.0
Hexachloroethane		106.3	23.8	138.1	2.8	30.0
1,2-Dibromo-3-chloropropane		107.5	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		104.8	27.4	143.4	2.9	30.0
1,2,3-Trichlorobenzene		105.9	75.4	131.4	3.0	30.0
Naphthalene		108.2	32.9	135.8	0.6	30.0
2-Methylnaphthalene		109.5	25.5	165.5	3.0	30.0

Organics - Volatiles, Prep Batch ID: VS230523W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230523A9.BLKS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 14:38, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.77	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:15, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523A9.LCSDS23A, Parent Sample ID: 230523A9.LCSS23A

Run in Batch: 230523A9, Run Date: 05/23/2023 13:36, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.1	70.0	130.0	3.3	30.0

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.57	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		107.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.2	70.0	130.0	7.2	30.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		110.0	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		113.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		114.5	70.0	130.0	2.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		127.7	70.0	130.0	4.1	30.0

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.28	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		123.9	70.0	130.0	16.5	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48714
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing
Submitted: 05/17/2023 16:50 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	Final courier did not sign all of the COCs
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S48714 Submitted: 05/17/2023 16:50

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30171056.0470B / RACER Lansing

Initial Preservation Check: 05/18/2023 09:51 MMC

Preservation Recheck (E200.8): N/A

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S48714.16	250ml Plastic H2SO4	<2			
S48714.17	250ml Plastic H2SO4	<2			
S48714.18	250ml Plastic H2SO4	<2			
S48714.19	250ml Plastic H2SO4	<2			
S48714.20	250ml Plastic H2SO4	<2			
S48714.21	250ml Plastic H2SO4	<2			
S48714.23	250ml Plastic H2SO4	<2			

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 3

152801

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.: US3460008097
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470B / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B - SIMS	Total Phosphorus SM 4500-PE	TKN 4500-Norg/NH3	Nitrate E 3000
48714.01	5/16/23	1440	MW-13-43_051623	GW	3		3						3				
.02	5/16/23	1630	MW-13-45_051623	GW	3		3						3				
.03	5/17/23	1050	MW-15-72_051723	GW	3		3						3				
.04	5/17/23	1150	MW-16-78_051723	GW	3		3						3				
.05	5/17/23	1245	MW-16-82_051723	GW	3		3						3				
.06	5/17/23	1405	MW-19-115_051723	GW	3		3						3				
.07	5/17/23	1525	MW-19-116_051723	GW	3		3						3				

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler DATE 5/17/23 TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION Johanna Murray DATE 5/17/23 TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 3

152802

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.: US346000 8097
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470B / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donnie Richmond / Donnie Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS	Total Phosphorus SM 4500-PE	TKN 4500-Norg/NH3	Nitrate E3000
48714.08	5/16/23	1400	MW-16-75_051623	GW	3		X						X				
.09	5/17/23	0915	MW-16-77_051723	GW	3		X						X				
.10	5/17/23	1100	MW-16-74_051723	GW	3		X						X				
.11	5/17/23	1205	MW-16-81_051723	GW	3		X						X	X			
.12	5/17/23	1355	MW-16-84_051723	GW	3		X						X	X			
.13/.14/.15	5/17/23	1540	MW-17-86_051723	GW	9		X						X	X			

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] Arcadis ☑ Sampler DATE: 5/17/23 TIME: 1600
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] Murray DATE: 5/17/23 TIME: 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 3 OF 3

152803

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.: US3460008097
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470B / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Bill Cobern

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS	Total Phosphorus SM 4500-PE	TKN 4500-Norg/NH3	Nitrate E300.0
48714.16	5/17/23	0425	MW-19-123_051723	GW	5	1	3		1				X		X	X	X
.17	5/17/23	1050	MW-19-121_051723	GW	5	1	3		1				X		X	X	X
.18	5/17/23	1220	MW-14-61_051723	GW	5	1	3		1				X	X	X	X	X
.19	5/17/23	1330	MW-20-128_051723	GW	5	1	3		1				X		X	X	X
.20	5/17/23	1440	MW-20-127_051723	GW	5	1	3		1				X		X	X	X
.21	5/17/23	15:50	TW-15-12_051723	GW	5	1	3		1				X		X	X	X
.22	5/16/23	—	Trip Blank	GW	1		1							X			
.23	5/17/23	—	DUP-02_051723	GW	5	1	3		1				X		X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 5.17.23	TIME 16:50
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 5/17/23	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 3.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48825.01(01)+QC01
Generated on 05/25/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48825.01-S48825.09
Project: 30171056.0470B / RACER Lansing
Collected Date(s): 05/19/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: US3460008097

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (9 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48825.01	MW-13-48_051923	Groundwater	05/19/23 08:45
S48825.02	MW-13-34_051923	Groundwater	05/19/23 09:45
S48825.03	MW-13-34_051923 MS	Groundwater	05/19/23 09:45
S48825.04	MW-13-34_051923 MSD	Groundwater	05/19/23 09:45
S48825.05	MW-13-22_051923	Groundwater	05/19/23 10:50
S48825.06	MW-12-21_051923	Groundwater	05/19/23 12:15
S48825.07	AS-19-A07_051923	Groundwater	05/19/23 13:10
S48825.08	AS-19-A06_051923	Groundwater	05/19/23 14:20
S48825.09	DUP-05_051923	Groundwater	05/19/23 00:01

Analytical Laboratory Report

Lab Sample ID: S48825.01
Sample Tag: MW-13-48_051923
Collected Date/Time: 05/19/2023 08:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 04:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	62	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48825.02
Sample Tag: MW-13-34_051923
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 05:21, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	109	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.03
Sample Tag: MW-13-34_051923 MS
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 00:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	166	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S48825.04
Sample Tag: MW-13-34_051923 MSD
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 01:03, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	173	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S48825.05
Sample Tag: MW-13-22_051923
Collected Date/Time: 05/19/2023 10:50
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 05:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	179	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48825.06
Sample Tag: MW-12-21_051923
Collected Date/Time: 05/19/2023 12:15
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 06:05, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	167	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.07
Sample Tag: AS-19-A07_051923
Collected Date/Time: 05/19/2023 13:10
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 18:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.08
Sample Tag: AS-19-A06_051923
Collected Date/Time: 05/19/2023 14:20
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 06:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.09
Sample Tag: DUP-05_051923
Collected Date/Time: 05/19/2023 00:01
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:10, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	162	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48825.01(01)+QC01
Generated on 05/25/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48825.01-S48825.09
Project: 30171056.0470B / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: US3460008097

QC Report Sections

Cover Page (Page 15)
Analysis Summary (Pages 16-24)
Prep Batch Summary (Page 25)
Surrogates per QC Sample (Pages 26-27)
Internal Standards per Lab Sample (Pages 28-34)
Internal Standards per QC Sample (Pages 35-36)
Batch QC Results (Pages 37-38)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48825.01
Sample Tag: MW-13-48_051923
Collected Date/Time: 05/19/2023 08:45
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 04:59	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.02
Sample Tag: MW-13-34_051923
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 05:21	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.03
Sample Tag: MW-13-34_051923 MS
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 00:42	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.04

Sample Tag: MW-13-34_051923 MSD

Collected Date/Time: 05/19/2023 09:45

Matrix: Groundwater

COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 01:03	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.05
Sample Tag: MW-13-22_051923
Collected Date/Time: 05/19/2023 10:50
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 05:43	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.06

Sample Tag: MW-12-21_051923

Collected Date/Time: 05/19/2023 12:15

Matrix: Groundwater

COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 06:05	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.07
Sample Tag: AS-19-A07_051923
Collected Date/Time: 05/19/2023 13:10
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 18:46	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48825.08
Sample Tag: AS-19-A06_051923
Collected Date/Time: 05/19/2023 14:20
Matrix: Groundwater
COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 06:48	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48825.09

Sample Tag: DUP-05_051923

Collected Date/Time: 05/19/2023 00:01

Matrix: Groundwater

COC Reference: 152807

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 07:10	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48825.01	1,4-Dioxane	SW8260B - SIM	05/24/23 04:59	230523B9
S48825.02	1,4-Dioxane	SW8260B - SIM	05/24/23 05:21	230523B9
S48825.03	1,4-Dioxane	SW8260B - SIM	05/24/23 00:42	230523B9
S48825.04	1,4-Dioxane	SW8260B - SIM	05/24/23 01:03	230523B9
S48825.05	1,4-Dioxane	SW8260B - SIM	05/24/23 05:43	230523B9
S48825.06	1,4-Dioxane	SW8260B - SIM	05/24/23 06:05	230523B9
S48825.08	1,4-Dioxane	SW8260B - SIM	05/24/23 06:48	230523B9
S48825.09	1,4-Dioxane	SW8260B - SIM	05/24/23 07:10	230523B9

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48825.07	1,4-Dioxane	SW8260B - SIM	05/24/23 18:46	230524A9

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48825.01

Sample Tag: MW-13-48_051923

Collected Date/Time: 05/19/2023 08:45

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 04:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Lab Sample ID: S48825.02

Sample Tag: MW-13-34_051923

Collected Date/Time: 05/19/2023 09:45

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 05:21, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

Lab Sample ID: S48825.05

Sample Tag: MW-13-22_051923

Collected Date/Time: 05/19/2023 10:50

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 05:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.3**	50.0	200.0

Lab Sample ID: S48825.06

Sample Tag: MW-12-21_051923

Collected Date/Time: 05/19/2023 12:15

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 06:05, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Lab Sample ID: S48825.07

Sample Tag: AS-19-A07_051923

Collected Date/Time: 05/19/2023 13:10

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 18:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.9**	50.0	200.0

Lab Sample ID: S48825.08

Sample Tag: AS-19-A06_051923

Collected Date/Time: 05/19/2023 14:20

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 06:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48825.09

Sample Tag: DUP-05_051923

Collected Date/Time: 05/19/2023 00:01

Matrix: Groundwater

COC Reference: 152807

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 07:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.57	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		107.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.2	70.0	130.0	7.2	30.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		110.0	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		113.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		114.5	70.0	130.0	2.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		127.7	70.0	130.0	4.1	30.0

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.28	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		123.9	70.0	130.0	16.5	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48825
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Prepared by Merit Laboratories

PLANT-3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152807

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR, SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO. 947-777-5215 CELL NO. —
P.O. NO. US346000080997
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30171056.04708 / RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J COBERN

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIMS										Special Instructions
48825.01	5/19/23	845	MW-13-48_051923	GW	3		3						X										
.02/.03/.04	5/19/23	945	MW-13-34_051923	GW	9		9						X										MS/MSD
.05	5/19/23	1050	MW-13-22_051923	GW	3		3						X										
.06	5/19/23	1215	MW-12-21_051923	GW	3		3						X										
.07	5/19/23	1310	AS-19-A07_051923	GW	3		3						X										
.08	5/19/23	1420	AS-19-A06_051923	GW	3		3						X										
.09	5/19/23	—	DUP-05_051923	GW	3		3						X										

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler ARCADIS DATE 5.19.23 TIME 16:30
RECEIVED BY: SIGNATURE/ORGANIZATION Johanna Murray DATE 5/19/23 TIME 1630
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RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: JRM TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48826.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
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Novi, MI 48377

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Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

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Report Summary

Lab Sample ID(s): S48826.01-S48826.07
Project: 30171056.0470B / RACER Lansing
Collected Date(s): 05/18/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Donald Richmond
P.O. #: US3460008097

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48826.01	MW-20-129_051823	Groundwater	05/18/23 09:35
S48826.02	MW-21-142_051823	Groundwater	05/18/23 12:10
S48826.03	PW-14-01_051823	Groundwater	05/18/23 13:35
S48826.04	PW-14-02_051823	Groundwater	05/18/23 13:45
S48826.05	TW-14-02_051823	Groundwater	05/18/23 14:30
S48826.06	DUP-03_051823	Groundwater	05/18/23 00:01
S48826.07	Trip Blanks	Groundwater	05/18/23 00:01

Lab Sample ID: S48826.01
Sample Tag: MW-20-129_051823
Collected Date/Time: 05/18/2023 09:35
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 19:08, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	103	1		ug/L	1	123-91-1	

Lab Sample ID: S48826.02
Sample Tag: MW-21-142_051823
Collected Date/Time: 05/18/2023 12:10
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 19:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	82	1		ug/L	1	123-91-1	

Lab Sample ID: S48826.03
Sample Tag: PW-14-01_051823
Collected Date/Time: 05/18/2023 13:35
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/26/23 15:45, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48826.04
Sample Tag: PW-14-02_051823
Collected Date/Time: 05/18/2023 13:45
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:16	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 20:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	14	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48826.04 (continued)
Sample Tag: PW-14-02_051823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:06, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48826.05
Sample Tag: TW-14-02_051823
Collected Date/Time: 05/18/2023 14:30
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:16	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 20:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/24/23 17:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48826.05 (continued)
Sample Tag: TW-14-02_051823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/24/23 17:40, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48826.06
Sample Tag: DUP-03_051823
Collected Date/Time: 05/18/2023 00:01
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:16	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 20:57, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	9	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48826.06 (continued)
Sample Tag: DUP-03_051823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:30, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48826.07
Sample Tag: Trip Blanks
Collected Date/Time: 05/18/2023 00:01
Matrix: Groundwater
COC Reference: 155890

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:16	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 14:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/24/23 16:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48826.07 (continued)
Sample Tag: Trip Blanks

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/24/23 16:26, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S48826.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48826.01-S48826.07
Project: 30171056.0470B / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Donald Richmond
P.O. #: US3460008097

QC Report Sections

Cover Page (Page 17)
Analysis Summary (Pages 18-24)
Prep Batch Summary (Page 25)
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Surrogates per QC Sample (Pages 31-34)
Internal Standards per Lab Sample (Pages 35-41)
Internal Standards per QC Sample (Pages 42-45)
Batch QC Results (Pages 46-57)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48826.01
Sample Tag: MW-20-129_051823
Collected Date/Time: 05/18/2023 09:35
Matrix: Groundwater
COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 19:08	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.02
Sample Tag: MW-21-142_051823
Collected Date/Time: 05/18/2023 12:10
Matrix: Groundwater
COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 19:29	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.03
Sample Tag: PW-14-01_051823
Collected Date/Time: 05/18/2023 13:35
Matrix: Groundwater
COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/26/23 15:45	230526A9	VS230526W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.04
Sample Tag: PW-14-02_051823
Collected Date/Time: 05/18/2023 13:45
Matrix: Groundwater
COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 20:13	230524A9	VS230524W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:06	230525A7	VF230525W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.05

Sample Tag: TW-14-02_051823

Collected Date/Time: 05/18/2023 14:30

Matrix: Groundwater

COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 20:36	230524A9	VS230524W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/24/23 17:40	230524A3	VF230524W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.06

Sample Tag: DUP-03_051823

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 20:57	230524A9	VS230524W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:30	230525A7	VF230525W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48826.07

Sample Tag: Trip Blanks

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 14:53	230524A9	VS230524W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	05/24/23 16:26	230524A3	VF230524W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230524W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48826.05	Volatile Organics - DEQ List	SW5030C/8260C	05/24/23 17:40	230524A3
S48826.07	Volatile Organics - DEQ List	SW5030C/8260C	05/24/23 16:26	230524A3

Organics - Volatiles, Prep Batch ID: VF230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48826.04	Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:06	230525A7
S48826.06	Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:30	230525A7

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48826.01	1,4-Dioxane	SW8260B - SIM	05/24/23 19:08	230524A9
S48826.02	1,4-Dioxane	SW8260B - SIM	05/24/23 19:29	230524A9
S48826.04	1,4-Dioxane	SW8260B - SIM	05/24/23 20:13	230524A9
S48826.05	1,4-Dioxane	SW8260B - SIM	05/24/23 20:36	230524A9
S48826.06	1,4-Dioxane	SW8260B - SIM	05/24/23 20:57	230524A9
S48826.07	1,4-Dioxane	SW8260B - SIM	05/24/23 14:53	230524A9

Organics - Volatiles, Prep Batch ID: VS230526W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48826.03	1,4-Dioxane	SW8260B - SIM	05/26/23 15:45	230526A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48826.03

Sample Tag: PW-14-01_051823

Collected Date/Time: 05/18/2023 13:35

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230526A9, Run Date: 05/26/2023 15:45, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**265.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48826.04

Sample Tag: PW-14-02_051823

Collected Date/Time: 05/18/2023 13:45

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:06, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**106.0**	80.0	124.0
1,2-Dichloroethane-D4		**99.1**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48826.05

Sample Tag: TW-14-02_051823

Collected Date/Time: 05/18/2023 14:30

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230524A3, Run Date: 05/24/2023 17:40, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**115.1**	81.0	124.0
1,2-Dichloroethane-D4		**80.8**	71.0	124.0
Toluene-D8		**90.7**	83.0	120.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48826.06

Sample Tag: DUP-03_051823

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:30, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**106.8**	80.0	124.0
1,2-Dichloroethane-D4		**94.8**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48826.07

Sample Tag: Trip Blanks

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230524A3, Run Date: 05/24/2023 16:26, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**100.0**	81.0	124.0
1,2-Dichloroethane-D4		**82.6**	71.0	124.0
Toluene-D8		**90.0**	83.0	120.0

Organics - Volatiles, Prep Batch ID: VF230524W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A3.BLKW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 13:38, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.8**	81.0	124.0
1,2-Dichloroethane-D4		**84.3**	71.0	124.0
Toluene-D8		**91.2**	83.0	120.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:04, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.7**	81.0	124.0
1,2-Dichloroethane-D4		**83.0**	71.0	124.0
Toluene-D8		**91.0**	83.0	120.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A3.LCSDW24A, Parent Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:27, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.4**	81.0	124.0
1,2-Dichloroethane-D4		**79.5**	71.0	124.0
Toluene-D8		**91.8**	83.0	120.0

Organics - Volatiles, Prep Batch ID: VF230525W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.9**	80.0	124.0
1,2-Dichloroethane-D4		**92.3**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.6**	80.0	124.0
1,2-Dichloroethane-D4		**95.2**	72.0	125.0
Toluene-D8		**100.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.7**	80.0	124.0
1,2-Dichloroethane-D4		**96.7**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230526W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230526A9.BLKS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 15:23, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**272.5**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 13:59, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**267.5**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230526A9.LCSDS26A, Parent Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 14:21, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**280.0**	60.0	140.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48826.01

Sample Tag: MW-20-129_051823

Collected Date/Time: 05/18/2023 09:35

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 19:08, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**79.3**	50.0	200.0

Lab Sample ID: S48826.02

Sample Tag: MW-21-142_051823

Collected Date/Time: 05/18/2023 12:10

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 19:29, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**84.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48826.03

Sample Tag: PW-14-01_051823

Collected Date/Time: 05/18/2023 13:35

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230526A9, Run Date: 05/26/2023 15:45, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**117.6**	50.0	200.0
1,4-Dioxane-D8		**114.5**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**107.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48826.04

Sample Tag: PW-14-02_051823

Collected Date/Time: 05/18/2023 13:45

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 20:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**87.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:06, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.3**	50.0	200.0
1,4-Difluorobenzene		**100.0**	50.0	200.0
Chlorobenzene-D5		**99.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48826.05

Sample Tag: TW-14-02_051823

Collected Date/Time: 05/18/2023 14:30

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 20:36, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**83.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230524A3, Run Date: 05/24/2023 17:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.6**	50.0	200.0
1,4-Difluorobenzene		**94.0**	50.0	200.0
Chlorobenzene-D5		**81.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48826.06

Sample Tag: DUP-03_051823

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 20:57, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.3**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.8**	50.0	200.0
1,4-Difluorobenzene		**98.4**	50.0	200.0
Chlorobenzene-D5		**95.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.0**	50.0	200.0

Lab Sample ID: S48826.07

Sample Tag: Trip Blanks

Collected Date/Time: 05/18/2023 00:01

Matrix: Groundwater

COC Reference: 155890

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 14:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230524A3, Run Date: 05/24/2023 16:26, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.9**	50.0	200.0
1,4-Difluorobenzene		**98.6**	50.0	200.0
Chlorobenzene-D5		**98.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230524W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A3.BLKW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 13:38, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**94.3**	50.0	200.0
1,4-Difluorobenzene		**94.8**	50.0	200.0
Chlorobenzene-D5		**96.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:04, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.5**	50.0	200.0
1,4-Difluorobenzene		**99.3**	50.0	200.0
Chlorobenzene-D5		**101.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A3.LCSDW24A, Parent Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:27, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.4**	50.0	200.0
1,4-Difluorobenzene		**98.1**	50.0	200.0
Chlorobenzene-D5		**99.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230525W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**94.8**	50.0	200.0
1,4-Difluorobenzene		**96.2**	50.0	200.0
Chlorobenzene-D5		**92.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**91.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.7**	50.0	200.0
1,4-Difluorobenzene		**97.9**	50.0	200.0
Chlorobenzene-D5		**97.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.8**	50.0	200.0
1,4-Difluorobenzene		**100.7**	50.0	200.0
Chlorobenzene-D5		**100.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230526W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230526A9.BLKS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 15:23, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**99.1**	50.0	200.0
1,4-Dioxane-D8		**93.6**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**94.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 13:59, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**100.1**	50.0	200.0
1,4-Dioxane-D8		**96.0**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**98.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230526A9.LCSDS26A, Parent Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 14:21, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**101.1**	50.0	200.0
1,4-Dioxane-D8		**113.1**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**98.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230524W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A3.BLKW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 13:38, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230524W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230524A3.BLKW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 13:38, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:04, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		108.3	51.7	123.0
Acetone		79.0	25.3	155.1
Methyl iodide		106.4	56.9	110.8
Carbon disulfide		113.8	57.0	123.0
tert-Methyl butyl ether (MTBE)		93.9	67.5	123.7
Acrylonitrile		95.7	58.7	133.0
2-Butanone (MEK)		88.3	38.7	136.9
Dichlorodifluoromethane		116.7	10.0	171.8
Chloromethane		127.3	30.2	152.7
Vinyl chloride		123.9	45.3	138.7
Bromomethane		105.9	10.0	157.4
Chloroethane		113.0	10.0	169.1
Trichlorofluoromethane		100.3	25.7	157.8
1,1-Dichloroethene		100.7	59.2	137.5
Methylene chloride		103.6	70.5	121.5
trans-1,2-Dichloroethene		99.1	72.5	128.8
1,1-Dichloroethane		101.1	72.5	123.4
cis-1,2-Dichloroethene		101.8	75.0	120.5
Tetrahydrofuran		77.6	48.2	125.7
Chloroform		96.3	74.6	123.2

Organics - Volatiles, Prep Batch ID: VF230524W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:04, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		99.0	72.3	122.8
1,1,1-Trichloroethane		91.6	73.8	128.9
4-Methyl-2-pentanone (MIBK)		93.8	60.4	133.8
2-Hexanone		96.9	45.7	141.9
Carbon tetrachloride		93.3	70.1	132.7
Benzene		101.4	74.6	128.9
1,2-Dichloroethane		77.9	73.2	125.4
Trichloroethene		97.9	74.1	127.6
1,2-Dichloropropane		95.9	77.6	124.4
Bromodichloromethane		91.8	76.7	128.4
Dibromomethane		93.7	72.5	127.3
cis-1,3-Dichloropropene		99.5	79.3	128.3
Toluene		97.9	74.8	129.2
trans-1,3-Dichloropropene		96.2	74.5	129.7
1,1,2-Trichloroethane		96.4	71.3	125.7
Tetrachloroethene		98.1	73.0	124.7
trans-1,4-Dichloro-2-butene		82.5	58.3	143.3
Dibromochloromethane		99.4	68.9	132.7
1,2-Dibromoethane		99.8	71.4	129.3
Chlorobenzene		102.6	74.2	128.1
1,1,1,2-Tetrachloroethane		100.0	76.6	133.0
Ethylbenzene		102.6	77.7	130.4
p,m-Xylene		101.7	79.8	132.0
o-Xylene		101.0	79.4	132.3
Styrene		101.4	71.3	119.3
Isopropylbenzene		101.9	70.3	128.2
Bromoform		102.6	54.7	137.4
1,1,2,2-Tetrachloroethane		103.8	65.4	134.9
1,2,3-Trichloropropane		95.6	67.2	154.5
n-Propylbenzene		103.8	77.3	135.2
Bromobenzene		97.0	74.0	132.4
1,3,5-Trimethylbenzene		100.8	75.6	137.0
tert-Butylbenzene		92.8	75.6	134.6
1,2,4-Trimethylbenzene		99.1	76.9	139.1
sec-Butylbenzene		103.0	72.7	135.6
p-Isopropyltoluene		101.8	77.1	140.9
1,3-Dichlorobenzene		96.4	77.3	131.0
1,4-Dichlorobenzene		97.5	33.1	125.8
1,2-Dichlorobenzene		97.3	73.5	132.7
1,2,3-Trimethylbenzene		97.7	70.9	130.2
n-Butylbenzene		102.5	75.0	138.6
Hexachloroethane		110.7	55.5	129.0
1,2-Dibromo-3-chloropropane		100.1	54.1	156.4
1,2,4-Trichlorobenzene		99.7	37.1	131.3
1,2,3-Trichlorobenzene		98.0	59.4	157.9
Naphthalene		99.5	39.3	129.2

Organics - Volatiles, Prep Batch ID: VF230524W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:04, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		94.6	10.0	175.9

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A3.LCSDW24A, Parent Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:27, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		109.2	51.7	123.0	0.8	30.0
Acetone		85.8	25.3	155.1	8.3	30.0
Methyl iodide		104.1	56.9	110.8	2.2	30.0
Carbon disulfide		108.7	57.0	123.0	4.6	30.0
tert-Methyl butyl ether (MTBE)		96.1	67.5	123.7	2.3	30.0
Acrylonitrile		99.8	58.7	133.0	4.1	30.0
2-Butanone (MEK)		93.9	38.7	136.9	6.1	30.0
Dichlorodifluoromethane		116.7	10.0	171.8	0.1	30.0
Chloromethane		122.8	30.2	152.7	3.6	30.0
Vinyl chloride		120.7	45.3	138.7	2.6	30.0
Bromomethane		103.5	10.0	157.4	2.3	30.0
Chloroethane		110.3	10.0	169.1	2.4	30.0
Trichlorofluoromethane		96.2	25.7	157.8	4.2	30.0
1,1-Dichloroethene		97.6	59.2	137.5	3.1	30.0
Methylene chloride		103.1	70.5	121.5	0.5	30.0
trans-1,2-Dichloroethene		96.4	72.5	128.8	2.8	30.0
1,1-Dichloroethane		99.8	72.5	123.4	1.3	30.0
cis-1,2-Dichloroethene		101.0	75.0	120.5	0.8	30.0
Tetrahydrofuran		83.1	48.2	125.7	6.8	30.0
Chloroform		95.4	74.6	123.2	0.9	30.0
Bromochloromethane		100.1	72.3	122.8	1.1	30.0
1,1,1-Trichloroethane		89.1	73.8	128.9	2.7	30.0
4-Methyl-2-pentanone (MIBK)		101.5	60.4	133.8	7.9	30.0
2-Hexanone		101.9	45.7	141.9	5.1	30.0
Carbon tetrachloride		90.8	70.1	132.7	2.7	30.0
Benzene		99.4	74.6	128.9	2.0	30.0
1,2-Dichloroethane		77.7	73.2	125.4	0.3	30.0
Trichloroethene		96.4	74.1	127.6	1.6	30.0
1,2-Dichloropropane		96.1	77.6	124.4	0.2	30.0
Bromodichloromethane		92.7	76.7	128.4	0.9	30.0
Dibromomethane		96.2	72.5	127.3	2.6	30.0
cis-1,3-Dichloropropene		100.4	79.3	128.3	0.8	30.0
Toluene		97.1	74.8	129.2	0.8	30.0
trans-1,3-Dichloropropene		98.5	74.5	129.7	2.4	30.0
1,1,2-Trichloroethane		99.6	71.3	125.7	3.2	30.0
Tetrachloroethene		96.4	73.0	124.7	1.8	30.0
trans-1,4-Dichloro-2-butene		87.2	58.3	143.3	5.5	30.0
Dibromochloromethane		101.7	68.9	132.7	2.2	30.0
1,2-Dibromoethane		103.8	71.4	129.3	3.9	30.0
Chlorobenzene		103.3	74.2	128.1	0.8	30.0

Organics - Volatiles, Prep Batch ID: VF230524W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230524A3.LCSDW24A, Parent Sample ID: 230524A3.LCSW24A

Run in Batch: 230524A3, Run Date: 05/24/2023 12:27, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.0	76.6	133.0	0.0	30.0
Ethylbenzene		101.8	77.7	130.4	0.8	30.0
p,m-Xylene		99.7	79.8	132.0	1.9	30.0
o-Xylene		99.0	79.4	132.3	2.0	30.0
Styrene		101.3	71.3	119.3	0.1	30.0
Isopropylbenzene		100.2	70.3	128.2	1.7	30.0
Bromoform		105.4	54.7	137.4	2.6	30.0
1,1,2,2-Tetrachloroethane		105.0	65.4	134.9	1.1	30.0
1,2,3-Trichloropropane		98.2	67.2	154.5	2.6	30.0
n-Propylbenzene		101.8	77.3	135.2	1.9	30.0
Bromobenzene		97.0	74.0	132.4	0.1	30.0
1,3,5-Trimethylbenzene		98.8	75.6	137.0	2.0	30.0
tert-Butylbenzene		91.6	75.6	134.6	1.4	30.0
1,2,4-Trimethylbenzene		98.1	76.9	139.1	1.0	30.0
sec-Butylbenzene		103.1	72.7	135.6	0.1	30.0
p-Isopropyltoluene		101.8	77.1	140.9	0.0	30.0
1,3-Dichlorobenzene		100.0	77.3	131.0	3.6	30.0
1,4-Dichlorobenzene		99.7	33.1	125.8	2.3	30.0
1,2-Dichlorobenzene		100.1	73.5	132.7	2.8	30.0
1,2,3-Trimethylbenzene		100.0	70.9	130.2	2.4	30.0
n-Butylbenzene		102.4	75.0	138.6	0.1	30.0
Hexachloroethane		111.0	55.5	129.0	0.2	30.0
1,2-Dibromo-3-chloropropane		96.4	54.1	156.4	3.8	30.0
1,2,4-Trichlorobenzene		104.1	37.1	131.3	4.4	30.0
1,2,3-Trichlorobenzene		103.6	59.4	157.9	5.6	30.0
Naphthalene		106.2	39.3	129.2	6.5	30.0
2-Methylnaphthalene		103.8	10.0	175.9	9.3	30.0

Organics - Volatiles, Prep Batch ID: VF230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		100.6	67.4	121.2
Acetone		91.4	29.9	161.5
Methyl iodide		109.5	68.8	116.4
Carbon disulfide		116.2	63.8	137.4
tert-Methyl butyl ether (MTBE)		95.7	73.2	122.4
Acrylonitrile		95.2	69.9	128.9
2-Butanone (MEK)		94.6	44.0	134.4
Dichlorodifluoromethane		108.4	10.0	222.8
Chloromethane		98.9	23.8	166.5
Vinyl chloride		101.9	43.5	149.1
Bromomethane		98.4	56.8	151.3
Chloroethane		98.0	53.4	149.4
Trichlorofluoromethane		103.9	59.7	151.8
1,1-Dichloroethene		105.5	69.6	139.4
Methylene chloride		103.0	73.3	121.1
trans-1,2-Dichloroethene		102.9	73.6	129.3
1,1-Dichloroethane		103.8	71.5	126.2
cis-1,2-Dichloroethene		104.4	76.6	122.1
Tetrahydrofuran		89.6	59.0	117.9
Chloroform		103.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		104.4	78.2	120.8
1,1,1-Trichloroethane		107.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		95.5	71.6	125.2
2-Hexanone		93.6	55.4	136.9
Carbon tetrachloride		105.8	72.6	133.0
Benzene		102.6	79.9	124.9
1,2-Dichloroethane		92.8	76.0	126.3
Trichloroethene		105.2	79.7	124.2
1,2-Dichloropropane		101.5	78.6	126.4
Bromodichloromethane		106.4	80.4	128.2
Dibromomethane		103.4	76.9	122.1
cis-1,3-Dichloropropene		107.1	79.8	129.9
Toluene		103.1	79.8	124.5
trans-1,3-Dichloropropene		105.6	74.0	131.3
1,1,2-Trichloroethane		100.3	78.7	123.1
Tetrachloroethene		105.2	74.5	124.5
trans-1,4-Dichloro-2-butene		104.4	68.6	135.4
Dibromochloromethane		111.9	74.6	127.2
1,2-Dibromoethane		103.6	70.3	133.7
Chlorobenzene		104.8	79.2	122.7
1,1,1,2-Tetrachloroethane		109.8	80.3	128.2
Ethylbenzene		106.7	79.5	129.1
p,m-Xylene		107.1	79.4	132.2
o-Xylene		107.6	80.2	131.0
Styrene		107.6	69.5	126.7
Isopropylbenzene		108.4	74.4	121.5
Bromoform		98.3	69.4	128.0
1,1,2,2-Tetrachloroethane		100.3	79.8	126.3
1,2,3-Trichloropropane		97.9	78.3	138.8
n-Propylbenzene		109.3	82.0	130.7
Bromobenzene		105.3	78.7	124.6
1,3,5-Trimethylbenzene		107.6	81.3	128.9
tert-Butylbenzene		105.8	80.7	128.9
1,2,4-Trimethylbenzene		107.6	81.4	130.8
sec-Butylbenzene		105.9	77.4	129.8
p-Isopropyltoluene		106.1	79.8	137.5
1,3-Dichlorobenzene		104.1	77.0	131.3
1,4-Dichlorobenzene		102.1	20.7	137.7
1,2-Dichlorobenzene		102.8	10.0	166.2
1,2,3-Trimethylbenzene		102.8	76.3	124.2
n-Butylbenzene		108.0	80.0	133.3
Hexachloroethane		100.9	23.8	138.1
1,2-Dibromo-3-chloropropane		88.9	21.2	189.4
1,2,4-Trichlorobenzene		99.6	27.4	143.4
1,2,3-Trichlorobenzene		98.3	75.4	131.4
Naphthalene		95.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		96.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		99.3	67.4	121.2	1.3	30.0
Acetone		100.7	29.9	161.5	9.7	30.0
Methyl iodide		102.9	68.8	116.4	6.3	30.0
Carbon disulfide		107.1	63.8	137.4	8.1	30.0
tert-Methyl butyl ether (MTBE)		97.9	73.2	122.4	2.3	30.0
Acrylonitrile		103.4	69.9	128.9	8.2	30.0
2-Butanone (MEK)		104.3	44.0	134.4	9.7	30.0
Dichlorodifluoromethane		100.7	10.0	222.8	7.4	30.0
Chloromethane		93.8	23.8	166.5	5.3	30.0
Vinyl chloride		95.7	43.5	149.1	6.3	30.0
Bromomethane		93.0	56.8	151.3	5.6	30.0
Chloroethane		91.1	53.4	149.4	7.3	30.0
Trichlorofluoromethane		95.6	59.7	151.8	8.3	30.0
1,1-Dichloroethene		98.8	69.6	139.4	6.5	30.0
Methylene chloride		99.3	73.3	121.1	3.6	30.0
trans-1,2-Dichloroethene		96.8	73.6	129.3	6.2	30.0
1,1-Dichloroethane		98.4	71.5	126.2	5.4	30.0
cis-1,2-Dichloroethene		100.9	76.6	122.1	3.4	30.0
Tetrahydrofuran		99.9	59.0	117.9	10.8	30.0
Chloroform		99.7	78.4	124.0	4.0	30.0
Bromochloromethane		101.4	78.2	120.8	3.0	30.0
1,1,1-Trichloroethane		99.2	79.4	130.9	8.0	30.0
4-Methyl-2-pentanone (MIBK)		106.5	71.6	125.2	11.0	30.0
2-Hexanone		106.6	55.4	136.9	12.9	30.0
Carbon tetrachloride		98.3	72.6	133.0	7.3	30.0
Benzene		97.7	79.9	124.9	4.9	30.0
1,2-Dichloroethane		92.7	76.0	126.3	0.1	30.0
Trichloroethene		98.3	79.7	124.2	6.8	30.0
1,2-Dichloropropane		96.9	78.6	126.4	4.7	30.0
Bromodichloromethane		103.8	80.4	128.2	2.5	30.0
Dibromomethane		103.8	76.9	122.1	0.4	30.0
cis-1,3-Dichloropropene		105.1	79.8	129.9	1.8	30.0
Toluene		97.5	79.8	124.5	5.5	30.0
trans-1,3-Dichloropropene		106.3	74.0	131.3	0.7	30.0
1,1,2-Trichloroethane		100.2	78.7	123.1	0.1	30.0
Tetrachloroethene		97.6	74.5	124.5	7.5	30.0
trans-1,4-Dichloro-2-butene		111.5	68.6	135.4	6.6	30.0
Dibromochloromethane		111.7	74.6	127.2	0.1	30.0
1,2-Dibromoethane		105.9	70.3	133.7	2.2	30.0
Chlorobenzene		99.3	79.2	122.7	5.4	30.0

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		104.1	80.3	128.2	5.3	30.0
Ethylbenzene		99.0	79.5	129.1	7.5	30.0
p,m-Xylene		99.9	79.4	132.2	6.9	30.0
o-Xylene		100.7	80.2	131.0	6.6	30.0
Styrene		102.2	69.5	126.7	5.1	30.0
Isopropylbenzene		99.3	74.4	121.5	8.8	30.0
Bromoform		102.0	69.4	128.0	3.7	30.0
1,1,2,2-Tetrachloroethane		105.4	79.8	126.3	5.0	30.0
1,2,3-Trichloropropane		103.4	78.3	138.8	5.4	30.0
n-Propylbenzene		99.8	82.0	130.7	9.0	30.0
Bromobenzene		100.8	78.7	124.6	4.4	30.0
1,3,5-Trimethylbenzene		99.4	81.3	128.9	7.9	30.0
tert-Butylbenzene		99.1	80.7	128.9	6.5	30.0
1,2,4-Trimethylbenzene		100.7	81.4	130.8	6.6	30.0
sec-Butylbenzene		96.8	77.4	129.8	9.0	30.0
p-Isopropyltoluene		97.3	79.8	137.5	8.7	30.0
1,3-Dichlorobenzene		96.7	77.0	131.3	7.4	30.0
1,4-Dichlorobenzene		96.9	20.7	137.7	5.2	30.0
1,2-Dichlorobenzene		97.4	10.0	166.2	5.4	30.0
1,2,3-Trimethylbenzene		96.1	76.3	124.2	6.8	30.0
n-Butylbenzene		98.1	80.0	133.3	9.6	30.0
Hexachloroethane		94.4	23.8	138.1	6.7	30.0
1,2-Dibromo-3-chloropropane		98.0	21.2	189.4	9.7	30.0
1,2,4-Trichlorobenzene		98.8	27.4	143.4	0.8	30.0
1,2,3-Trichlorobenzene		99.6	75.4	131.4	1.3	30.0
Naphthalene		103.5	32.9	135.8	7.9	30.0
2-Methylnaphthalene		109.5	25.5	165.5	12.9	30.0

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.28	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		123.9	70.0	130.0	16.5	30.0

Organics - Volatiles, Prep Batch ID: VS230526W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230526A9.BLKS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 15:23, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	1.19	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 13:59, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230526A9.LCSDS26A, Parent Sample ID: 230526A9.LCSS26A

Run in Batch: 230526A9, Run Date: 05/26/2023 14:21, Prep Date: 05/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.4	70.0	130.0	2.1	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48826
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

PLANT-2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 155890

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947 777 5215 CELL NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com
P.O. NO.: US346 000 8097
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470B/Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☑ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☑ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B - SIMS	VOCs 8260B - SIMS
48826.01	5/18/23	0935	MW-20-129_051823	GW	3		X						X	X
.02	5/18/23	1210	MW-21-142_051823	GW	3		X						X	X
.03	5/18/23	1335	PW-14-01_051823	GW	3		X						X	X
.04	5/18/23	1345	PW-14-02_051823	GW	3		X						X	X
.05	5/18/23	1430	TW-14-02_051823	GW	3		X						X	X
.06	5/18/23	—	DUP-03_051823	GW	3		X						X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Donald Richmond/Arcadis ☑ Sampler DATE: 5/18/23 TIME: 1635
RECEIVED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 5/18/23 TIME: 1635

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 5-19-23 TIME: 1630
RECEIVED BY: SIGNATURE/ORGANIZATION: Jahnna Muncy DATE: 5/19/23 TIME: 1530

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48827.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48827.01-S48827.03
Project: 30171056.0470A / RACER Lansing
Collected Date(s): 05/18/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30171056.0470A

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48827.01	MW-21-141_051823	Groundwater	05/18/23 12:25
S48827.02	MW-21-141_051823 MS	Groundwater	05/18/23 12:25
S48827.03	MW-21-141_051823 MSD	Groundwater	05/18/23 12:25

Analytical Laboratory Report

Lab Sample ID: S48827.01
Sample Tag: MW-21-141_051823
Collected Date/Time: 05/18/2023 12:25
Matrix: Groundwater
COC Reference: 152320

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 19:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48827.02
Sample Tag: MW-21-141_051823 MS
Collected Date/Time: 05/18/2023 12:25
Matrix: Groundwater
COC Reference: 152320

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 20:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	52	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S48827.03
Sample Tag: MW-21-141_051823 MSD
Collected Date/Time: 05/18/2023 12:25
Matrix: Groundwater
COC Reference: 152320

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 20:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	48	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Quality Control Report

Report ID: S48827.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48827.01-S48827.03
Project: 30171056.0470A / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30171056.0470A

QC Report Sections

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Analysis Summary (Pages 10-12)
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Surrogates per QC Sample (Page 14)
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Internal Standards per QC Sample (Page 16)
Batch QC Results (Page 17)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S48827.01
Sample Tag: MW-21-141_051823
Collected Date/Time: 05/18/2023 12:25
Matrix: Groundwater
COC Reference: 152320

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 19:28	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48827.02

Sample Tag: MW-21-141_051823 MS

Collected Date/Time: 05/18/2023 12:25

Matrix: Groundwater

COC Reference: 152320

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 20:32	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48827.03

Sample Tag: MW-21-141_051823 MSD

Collected Date/Time: 05/18/2023 12:25

Matrix: Groundwater

COC Reference: 152320

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 20:53	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48827.01	1,4-Dioxane	SW8260B - SIM	05/25/23 19:28	230525A9
S48827.02	1,4-Dioxane	SW8260B - SIM	05/25/23 20:32	230525A9
S48827.03	1,4-Dioxane	SW8260B - SIM	05/25/23 20:53	230525A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48827.01

Sample Tag: MW-21-141_051823

Collected Date/Time: 05/18/2023 12:25

Matrix: Groundwater

COC Reference: 152320

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 19:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.5**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48827
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152320

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470A / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus W.C

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS	Special Instructions
.01/.02/.03	5/18/23	1225	MW-21-141_051823	GW	9		9						X		MS/MSD
48827.04															

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Austin Westhuis / Arcadis ☒ Sampler DATE: 5.18.23 TIME: 16:35
RECEIVED BY: SIGNATURE/ORGANIZATION: ARCADIS DATE: 5.18.23 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: ARCADIS DATE: 5-19-23 TIME: 16:30
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 5/19/23 TIME: 1530
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP ON ARRIVAL: JRM ~~0.0~~ 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48828.01(01)+QC01
Generated on 05/25/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48828.01-S48828.02
Project: 30171056.0470A / RACER Lansing
Collected Date(s): 05/18/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30171056.0470A

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48828.01	MW-20-130_051823	Groundwater	05/18/23 10:05
S48828.02	MW-16-85_051823	Groundwater	05/18/23 16:30

Analytical Laboratory Report

Lab Sample ID: S48828.01
Sample Tag: MW-20-130_051823
Collected Date/Time: 05/18/2023 10:05
Matrix: Groundwater
COC Reference: 152319

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48828.02
Sample Tag: MW-16-85_051823
Collected Date/Time: 05/18/2023 16:30
Matrix: Groundwater
COC Reference: 152319

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48828.01(01)+QC01
Generated on 05/25/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48828.01-S48828.02
Project: 30171056.0470A / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Austin Westhuis
P.O. #: 30171056.0470A

QC Report Sections

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Analysis Summary (Pages 9-10)
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Surrogates per QC Sample (Page 12)
Internal Standards per Lab Sample (Pages 13-14)
Internal Standards per QC Sample (Page 15)
Batch QC Results (Page 16)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48828.01
Sample Tag: MW-20-130_051823
Collected Date/Time: 05/18/2023 10:05
Matrix: Groundwater
COC Reference: 152319

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 07:32	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48828.02
Sample Tag: MW-16-85_051823
Collected Date/Time: 05/18/2023 16:30
Matrix: Groundwater
COC Reference: 152319

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 07:54	230523B9	VS230523W3	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48828.01	1,4-Dioxane	SW8260B - SIM	05/24/23 07:32	230523B9
S48828.02	1,4-Dioxane	SW8260B - SIM	05/24/23 07:54	230523B9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48828.01

Sample Tag: MW-20-130_051823

Collected Date/Time: 05/18/2023 10:05

Matrix: Groundwater

COC Reference: 152319

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 07:32, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48828.02

Sample Tag: MW-16-85_051823

Collected Date/Time: 05/18/2023 16:30

Matrix: Groundwater

COC Reference: 152319

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230523B9, Run Date: 05/24/2023 07:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230523W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.5**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.7**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230523W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230523B9.BLKS23B

Run in Batch: 230523B9, Run Date: 05/24/2023 02:05, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.57	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:19, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		107.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230523B9.LCSDS23B, Parent Sample ID: 230523B9.LCSS23B

Run in Batch: 230523B9, Run Date: 05/23/2023 23:39, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.2	70.0	130.0	7.2	30.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4871414M, Parent Sample ID: S48714.13

Run in Batch: 230523B9, Run Date: 05/24/2023 00:00, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		110.0	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230523B9.4882503M, Parent Sample ID: S48825.02

Run in Batch: 230523B9, Run Date: 05/24/2023 00:42, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		113.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4871415N, Parent Sample ID: 230523B9.4871414M

Run in Batch: 230523B9, Run Date: 05/24/2023 00:21, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		114.5	70.0	130.0	2.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230523B9.4882504N, Parent Sample ID: 230523B9.4882503M

Run in Batch: 230523B9, Run Date: 05/24/2023 01:03, Prep Date: 05/23/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		127.7	70.0	130.0	4.1	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48828
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Prepared by Merit Laboratories

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152319

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470A / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS
48828.01	5/18/23	1005	MW-20-130_051823	GW	3		3						X	
.02	5/18/23	1630	MW-16-85_051823	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / Arcadis ☒ Sampler DATE: 5/18/23 TIME: 1635
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS DATE: 5-18-23 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS DATE: 5.19.23 TIME: 15:30
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 5/19/23 TIME: 1530

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48829.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48829.01-S48829.05
Project: 30171056.0470B / RACER Lansing
Collected Date(s): 05/18/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: US3460008097

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48829.01	MW-19-122_051823	Groundwater	05/18/23 10:15
S48829.02	MW-19-124_051823	Groundwater	05/18/23 11:30
S48829.03	MW-19-120_051823	Groundwater	05/18/23 12:40
S48829.04	MW-19-117_051823	Groundwater	05/18/23 13:55
S48829.05	MW-20-126_051823	Groundwater	05/18/23 16:10

Lab Sample ID: S48829.01
Sample Tag: MW-19-122_051823
Collected Date/Time: 05/18/2023 10:15
Matrix: Groundwater
COC Reference: 155891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 21:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S48829.02
Sample Tag: MW-19-124_051823
Collected Date/Time: 05/18/2023 11:30
Matrix: Groundwater
COC Reference: 155891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 22:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	172	1		ug/L	1	123-91-1	

Lab Sample ID: S48829.03
Sample Tag: MW-19-120_051823
Collected Date/Time: 05/18/2023 12:40
Matrix: Groundwater
COC Reference: 155891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:16	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 13:18, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	15	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S48829.03 (continued)
Sample Tag: MW-19-120_051823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/25/23 14:53, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S48829.04
Sample Tag: MW-19-117_051823
Collected Date/Time: 05/18/2023 13:55
Matrix: Groundwater
COC Reference: 155891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 13:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48829.05
Sample Tag: MW-20-126_051823
Collected Date/Time: 05/18/2023 16:10
Matrix: Groundwater
COC Reference: 155891

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 14:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	81	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48829.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48829.01-S48829.05
Project: 30171056.0470B / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: US3460008097

QC Report Sections

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Analysis Summary (Pages 13-17)
Prep Batch Summary (Page 18)
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Surrogates per QC Sample (Pages 20-22)
Internal Standards per Lab Sample (Pages 23-27)
Internal Standards per QC Sample (Pages 28-30)
Batch QC Results (Pages 31-37)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48829.01
Sample Tag: MW-19-122_051823
Collected Date/Time: 05/18/2023 10:15
Matrix: Groundwater
COC Reference: 155891

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 21:41	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48829.02
Sample Tag: MW-19-124_051823
Collected Date/Time: 05/18/2023 11:30
Matrix: Groundwater
COC Reference: 155891

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/24/23 22:02	230524A9	VS230524W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48829.03
Sample Tag: MW-19-120_051823
Collected Date/Time: 05/18/2023 12:40
Matrix: Groundwater
COC Reference: 155891

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 13:18	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:53	230525A7	VF230525W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S48829.04
Sample Tag: MW-19-117_051823
Collected Date/Time: 05/18/2023 13:55
Matrix: Groundwater
COC Reference: 155891

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 13:40	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48829.05
Sample Tag: MW-20-126_051823
Collected Date/Time: 05/18/2023 16:10
Matrix: Groundwater
COC Reference: 155891

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 14:01	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48829.03	Volatile Organics - DEQ List	SW5030C/8260C	05/25/23 14:53	230525A7

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48829.01	1,4-Dioxane	SW8260B - SIM	05/24/23 21:41	230524A9
S48829.02	1,4-Dioxane	SW8260B - SIM	05/24/23 22:02	230524A9

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48829.03	1,4-Dioxane	SW8260B - SIM	05/25/23 13:18	230525A9
S48829.04	1,4-Dioxane	SW8260B - SIM	05/25/23 13:40	230525A9
S48829.05	1,4-Dioxane	SW8260B - SIM	05/25/23 14:01	230525A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48829.03

Sample Tag: MW-19-120_051823

Collected Date/Time: 05/18/2023 12:40

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**106.2**	80.0	124.0
1,2-Dichloroethane-D4		**97.0**	72.0	125.0
Toluene-D8		**99.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230525W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.9**	80.0	124.0
1,2-Dichloroethane-D4		**92.3**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.6**	80.0	124.0
1,2-Dichloroethane-D4		**95.2**	72.0	125.0
Toluene-D8		**100.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.7**	80.0	124.0
1,2-Dichloroethane-D4		**96.7**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48829.01

Sample Tag: MW-19-122_051823

Collected Date/Time: 05/18/2023 10:15

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 21:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**79.5**	50.0	200.0

Lab Sample ID: S48829.02

Sample Tag: MW-19-124_051823

Collected Date/Time: 05/18/2023 11:30

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230524A9, Run Date: 05/24/2023 22:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**77.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48829.03

Sample Tag: MW-19-120_051823

Collected Date/Time: 05/18/2023 12:40

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 13:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**111.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230525A7, Run Date: 05/25/2023 14:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**94.9**	50.0	200.0
1,4-Difluorobenzene		**97.5**	50.0	200.0
Chlorobenzene-D5		**95.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48829.04

Sample Tag: MW-19-117_051823

Collected Date/Time: 05/18/2023 13:55

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 13:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.6**	50.0	200.0

Lab Sample ID: S48829.05

Sample Tag: MW-20-126_051823

Collected Date/Time: 05/18/2023 16:10

Matrix: Groundwater

COC Reference: 155891

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 14:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230525W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**94.8**	50.0	200.0
1,4-Difluorobenzene		**96.2**	50.0	200.0
Chlorobenzene-D5		**92.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**91.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.7**	50.0	200.0
1,4-Difluorobenzene		**97.9**	50.0	200.0
Chlorobenzene-D5		**97.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.8**	50.0	200.0
1,4-Difluorobenzene		**100.7**	50.0	200.0
Chlorobenzene-D5		**100.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230524W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**88.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230525A7.BLKW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 13:42, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		100.6	67.4	121.2
Acetone		91.4	29.9	161.5
Methyl iodide		109.5	68.8	116.4
Carbon disulfide		116.2	63.8	137.4
tert-Methyl butyl ether (MTBE)		95.7	73.2	122.4
Acrylonitrile		95.2	69.9	128.9
2-Butanone (MEK)		94.6	44.0	134.4
Dichlorodifluoromethane		108.4	10.0	222.8
Chloromethane		98.9	23.8	166.5
Vinyl chloride		101.9	43.5	149.1
Bromomethane		98.4	56.8	151.3
Chloroethane		98.0	53.4	149.4
Trichlorofluoromethane		103.9	59.7	151.8
1,1-Dichloroethene		105.5	69.6	139.4
Methylene chloride		103.0	73.3	121.1
trans-1,2-Dichloroethene		102.9	73.6	129.3
1,1-Dichloroethane		103.8	71.5	126.2
cis-1,2-Dichloroethene		104.4	76.6	122.1
Tetrahydrofuran		89.6	59.0	117.9
Chloroform		103.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		104.4	78.2	120.8
1,1,1-Trichloroethane		107.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		95.5	71.6	125.2
2-Hexanone		93.6	55.4	136.9
Carbon tetrachloride		105.8	72.6	133.0
Benzene		102.6	79.9	124.9
1,2-Dichloroethane		92.8	76.0	126.3
Trichloroethene		105.2	79.7	124.2
1,2-Dichloropropane		101.5	78.6	126.4
Bromodichloromethane		106.4	80.4	128.2
Dibromomethane		103.4	76.9	122.1
cis-1,3-Dichloropropene		107.1	79.8	129.9
Toluene		103.1	79.8	124.5
trans-1,3-Dichloropropene		105.6	74.0	131.3
1,1,2-Trichloroethane		100.3	78.7	123.1
Tetrachloroethene		105.2	74.5	124.5
trans-1,4-Dichloro-2-butene		104.4	68.6	135.4
Dibromochloromethane		111.9	74.6	127.2
1,2-Dibromoethane		103.6	70.3	133.7
Chlorobenzene		104.8	79.2	122.7
1,1,1,2-Tetrachloroethane		109.8	80.3	128.2
Ethylbenzene		106.7	79.5	129.1
p,m-Xylene		107.1	79.4	132.2
o-Xylene		107.6	80.2	131.0
Styrene		107.6	69.5	126.7
Isopropylbenzene		108.4	74.4	121.5
Bromoform		98.3	69.4	128.0
1,1,2,2-Tetrachloroethane		100.3	79.8	126.3
1,2,3-Trichloropropane		97.9	78.3	138.8
n-Propylbenzene		109.3	82.0	130.7
Bromobenzene		105.3	78.7	124.6
1,3,5-Trimethylbenzene		107.6	81.3	128.9
tert-Butylbenzene		105.8	80.7	128.9
1,2,4-Trimethylbenzene		107.6	81.4	130.8
sec-Butylbenzene		105.9	77.4	129.8
p-Isopropyltoluene		106.1	79.8	137.5
1,3-Dichlorobenzene		104.1	77.0	131.3
1,4-Dichlorobenzene		102.1	20.7	137.7
1,2-Dichlorobenzene		102.8	10.0	166.2
1,2,3-Trimethylbenzene		102.8	76.3	124.2
n-Butylbenzene		108.0	80.0	133.3
Hexachloroethane		100.9	23.8	138.1
1,2-Dibromo-3-chloropropane		88.9	21.2	189.4
1,2,4-Trichlorobenzene		99.6	27.4	143.4
1,2,3-Trichlorobenzene		98.3	75.4	131.4
Naphthalene		95.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:08, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		96.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		99.3	67.4	121.2	1.3	30.0
Acetone		100.7	29.9	161.5	9.7	30.0
Methyl iodide		102.9	68.8	116.4	6.3	30.0
Carbon disulfide		107.1	63.8	137.4	8.1	30.0
tert-Methyl butyl ether (MTBE)		97.9	73.2	122.4	2.3	30.0
Acrylonitrile		103.4	69.9	128.9	8.2	30.0
2-Butanone (MEK)		104.3	44.0	134.4	9.7	30.0
Dichlorodifluoromethane		100.7	10.0	222.8	7.4	30.0
Chloromethane		93.8	23.8	166.5	5.3	30.0
Vinyl chloride		95.7	43.5	149.1	6.3	30.0
Bromomethane		93.0	56.8	151.3	5.6	30.0
Chloroethane		91.1	53.4	149.4	7.3	30.0
Trichlorofluoromethane		95.6	59.7	151.8	8.3	30.0
1,1-Dichloroethene		98.8	69.6	139.4	6.5	30.0
Methylene chloride		99.3	73.3	121.1	3.6	30.0
trans-1,2-Dichloroethene		96.8	73.6	129.3	6.2	30.0
1,1-Dichloroethane		98.4	71.5	126.2	5.4	30.0
cis-1,2-Dichloroethene		100.9	76.6	122.1	3.4	30.0
Tetrahydrofuran		99.9	59.0	117.9	10.8	30.0
Chloroform		99.7	78.4	124.0	4.0	30.0
Bromochloromethane		101.4	78.2	120.8	3.0	30.0
1,1,1-Trichloroethane		99.2	79.4	130.9	8.0	30.0
4-Methyl-2-pentanone (MIBK)		106.5	71.6	125.2	11.0	30.0
2-Hexanone		106.6	55.4	136.9	12.9	30.0
Carbon tetrachloride		98.3	72.6	133.0	7.3	30.0
Benzene		97.7	79.9	124.9	4.9	30.0
1,2-Dichloroethane		92.7	76.0	126.3	0.1	30.0
Trichloroethene		98.3	79.7	124.2	6.8	30.0
1,2-Dichloropropane		96.9	78.6	126.4	4.7	30.0
Bromodichloromethane		103.8	80.4	128.2	2.5	30.0
Dibromomethane		103.8	76.9	122.1	0.4	30.0
cis-1,3-Dichloropropene		105.1	79.8	129.9	1.8	30.0
Toluene		97.5	79.8	124.5	5.5	30.0
trans-1,3-Dichloropropene		106.3	74.0	131.3	0.7	30.0
1,1,2-Trichloroethane		100.2	78.7	123.1	0.1	30.0
Tetrachloroethene		97.6	74.5	124.5	7.5	30.0
trans-1,4-Dichloro-2-butene		111.5	68.6	135.4	6.6	30.0
Dibromochloromethane		111.7	74.6	127.2	0.1	30.0
1,2-Dibromoethane		105.9	70.3	133.7	2.2	30.0
Chlorobenzene		99.3	79.2	122.7	5.4	30.0

Organics - Volatiles, Prep Batch ID: VF230525W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230525A7.LCSDW25A, Parent Sample ID: 230525A7.LCSW25A

Run in Batch: 230525A7, Run Date: 05/25/2023 12:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		104.1	80.3	128.2	5.3	30.0
Ethylbenzene		99.0	79.5	129.1	7.5	30.0
p,m-Xylene		99.9	79.4	132.2	6.9	30.0
o-Xylene		100.7	80.2	131.0	6.6	30.0
Styrene		102.2	69.5	126.7	5.1	30.0
Isopropylbenzene		99.3	74.4	121.5	8.8	30.0
Bromoform		102.0	69.4	128.0	3.7	30.0
1,1,2,2-Tetrachloroethane		105.4	79.8	126.3	5.0	30.0
1,2,3-Trichloropropane		103.4	78.3	138.8	5.4	30.0
n-Propylbenzene		99.8	82.0	130.7	9.0	30.0
Bromobenzene		100.8	78.7	124.6	4.4	30.0
1,3,5-Trimethylbenzene		99.4	81.3	128.9	7.9	30.0
tert-Butylbenzene		99.1	80.7	128.9	6.5	30.0
1,2,4-Trimethylbenzene		100.7	81.4	130.8	6.6	30.0
sec-Butylbenzene		96.8	77.4	129.8	9.0	30.0
p-Isopropyltoluene		97.3	79.8	137.5	8.7	30.0
1,3-Dichlorobenzene		96.7	77.0	131.3	7.4	30.0
1,4-Dichlorobenzene		96.9	20.7	137.7	5.2	30.0
1,2-Dichlorobenzene		97.4	10.0	166.2	5.4	30.0
1,2,3-Trimethylbenzene		96.1	76.3	124.2	6.8	30.0
n-Butylbenzene		98.1	80.0	133.3	9.6	30.0
Hexachloroethane		94.4	23.8	138.1	6.7	30.0
1,2-Dibromo-3-chloropropane		98.0	21.2	189.4	9.7	30.0
1,2,4-Trichlorobenzene		98.8	27.4	143.4	0.8	30.0
1,2,3-Trichlorobenzene		99.6	75.4	131.4	1.3	30.0
Naphthalene		103.5	32.9	135.8	7.9	30.0
2-Methylnaphthalene		109.5	25.5	165.5	12.9	30.0

Organics - Volatiles, Prep Batch ID: VS230524W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230524A9.BLKS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 14:32, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.28	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:09, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230524A9.LCSDS24A, Parent Sample ID: 230524A9.LCSS24A

Run in Batch: 230524A9, Run Date: 05/24/2023 13:30, Prep Date: 05/24/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		123.9	70.0	130.0	16.5	30.0

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48829
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

PLANT-2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 155891

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR, SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: _____ P.O. NO.: US 3460008097
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30171056.04708 / RACECANYON
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J. GOBLE

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIMS	VOC-8260B SIMS
48829.01	5/18/23	1015	MW-19-122_051823	GW	3		3						X	
.02	5/18/23	1130	MW-19-124_051823	GW	3		3						X	
.03	5/18/23	1240	MW-19-120_051823	GW	3		3						X	X
.04	5/18/23	1355	MW-19-117_051823	GW	3		3						X	
.05	5/18/23	1610	MW-20-126_051823	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	ARCADIS ☒ Sampler	5.19.23	16:30
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
Johanna Murray		5/19/23	1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL _____ 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48830.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48830.01
Project: 30171056.0470A / RACER Lansing
Collected Date(s): 05/18/2023
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: 30171056.0470A

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48830.01	MW-21-140_051823	Groundwater	05/18/23 09:15

Analytical Laboratory Report

Lab Sample ID: S48830.01
Sample Tag: MW-21-140_051823
Collected Date/Time: 05/18/2023 09:15
Matrix: Groundwater
COC Reference: 152805

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 20:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48830.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48830.01
Project: 30171056.0470A / RACER Lansing
Submitted Date/Time: 05/19/2023 15:30
Sampled by: Billy Cobern
P.O. #: 30171056.0470A

QC Report Sections

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Analysis Summary (Page 8)
Prep Batch Summary (Page 9)
Surrogates per QC Sample (Page 10)
Internal Standards per Lab Sample (Page 11)
Internal Standards per QC Sample (Page 12)
Batch QC Results (Page 13)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S48830.01
Sample Tag: MW-21-140_051823
Collected Date/Time: 05/18/2023 09:15
Matrix: Groundwater
COC Reference: 152805

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 20:12	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48830.01	1,4-Dioxane	SW8260B - SIM	05/25/23 20:12	230525A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48830.01

Sample Tag: MW-21-140_051823

Collected Date/Time: 05/18/2023 09:15

Matrix: Groundwater

COC Reference: 152805

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 20:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.9**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48830
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing
Submitted: 05/19/2023 15:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

PLANT-2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152805

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR STE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30171056.0470A / RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J. COGAN /

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG, IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS
48830.01	5/18/23	9:15	MW-21-140_051823	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS ☒ Sampler DATE: 5-19-23 TIME: 16:30
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 5/19/23 TIME: 1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48833.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48833.01-S48833.07
Project: 30171056.0470B / RACER Lansing
Collected Date(s): 05/20/2023
Submitted Date/Time: 05/22/2023 08:35
Sampled by: Billy Cobern
P.O. #: US3460008097

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48833.01	MW-13-27_052023	Groundwater	05/20/23 08:30
S48833.02	MW-13-30_052023	Groundwater	05/20/23 09:50
S48833.03	MW-13-26_052023	Groundwater	05/20/23 11:10
S48833.04	PW-14-03_052023	Groundwater	05/20/23 12:15
S48833.05	TW-15-11_052023	Groundwater	05/20/23 13:10
S48833.06	DUP-06_052023	Groundwater	05/20/23 00:01
S48833.07	Trip Blank_052023	Water	05/20/23 00:01

Analytical Laboratory Report

Lab Sample ID: S48833.01
Sample Tag: MW-13-27_052023
Collected Date/Time: 05/20/2023 08:30
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 14:44, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	10	1		ug/L	1	123-91-1	

Lab Sample ID: S48833.02
Sample Tag: MW-13-30_052023
Collected Date/Time: 05/20/2023 09:50
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 15:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48833.03
Sample Tag: MW-13-26_052023
Collected Date/Time: 05/20/2023 11:10
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 15:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48833.04
Sample Tag: PW-14-03_052023
Collected Date/Time: 05/20/2023 12:15
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 16:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48833.05
Sample Tag: TW-15-11_052023
Collected Date/Time: 05/20/2023 13:10
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 15:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	47	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48833.06
Sample Tag: DUP-06_052023
Collected Date/Time: 05/20/2023 00:01
Matrix: Groundwater
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 16:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	46	1		ug/L	1	123-91-1	

Lab Sample ID: S48833.07
Sample Tag: Trip Blank_052023
Collected Date/Time: 05/20/2023 00:01
Matrix: Water
COC Reference: 152808

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.1	IR

Other / Misc.

Method: , Run Date: 05/23/23 10:50, Analyst: JRM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Quality Control Report

Report ID: S48833.01(01)+QC01
Generated on 05/30/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48833.01-S48833.06
Project: 30171056.0470B / RACER Lansing
Submitted Date/Time: 05/22/2023 08:35
Sampled by: Billy Cobern
P.O. #: US3460008097

QC Report Sections

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Analysis Summary (Pages 14-19)
Prep Batch Summary (Page 20)
Surrogates per QC Sample (Page 21)
Internal Standards per Lab Sample (Pages 22-27)
Internal Standards per QC Sample (Page 28)
Batch QC Results (Page 29)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48833.01
Sample Tag: MW-13-27_052023
Collected Date/Time: 05/20/2023 08:30
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 14:44	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48833.02
Sample Tag: MW-13-30_052023
Collected Date/Time: 05/20/2023 09:50
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 15:06	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48833.03
Sample Tag: MW-13-26_052023
Collected Date/Time: 05/20/2023 11:10
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 15:28	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48833.04
Sample Tag: PW-14-03_052023
Collected Date/Time: 05/20/2023 12:15
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 16:11	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48833.05
Sample Tag: TW-15-11_052023
Collected Date/Time: 05/20/2023 13:10
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 15:49	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S48833.06
Sample Tag: DUP-06_052023
Collected Date/Time: 05/20/2023 00:01
Matrix: Groundwater
COC Reference: 152808

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 16:33	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48833.01	1,4-Dioxane	SW8260B - SIM	05/25/23 14:44	230525A9
S48833.02	1,4-Dioxane	SW8260B - SIM	05/25/23 15:06	230525A9
S48833.03	1,4-Dioxane	SW8260B - SIM	05/25/23 15:28	230525A9
S48833.04	1,4-Dioxane	SW8260B - SIM	05/25/23 16:11	230525A9
S48833.05	1,4-Dioxane	SW8260B - SIM	05/25/23 15:49	230525A9
S48833.06	1,4-Dioxane	SW8260B - SIM	05/25/23 16:33	230525A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.01

Sample Tag: MW-13-27_052023

Collected Date/Time: 05/20/2023 08:30

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 14:44, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.02

Sample Tag: MW-13-30_052023

Collected Date/Time: 05/20/2023 09:50

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 15:06, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.03

Sample Tag: MW-13-26_052023

Collected Date/Time: 05/20/2023 11:10

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 15:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.04

Sample Tag: PW-14-03_052023

Collected Date/Time: 05/20/2023 12:15

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 16:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.05

Sample Tag: TW-15-11_052023

Collected Date/Time: 05/20/2023 13:10

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 15:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48833.06

Sample Tag: DUP-06_052023

Collected Date/Time: 05/20/2023 00:01

Matrix: Groundwater

COC Reference: 152808

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 16:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48833
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing
Submitted: 05/22/2023 08:35 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152808

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR, SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: —
P.O. NO.: US 3460008097
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.04708 / RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BRETT COBEN

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG. IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIMS
48833.01	5/20/23	0830	MW-13-27_052023	GW	3		3						X
.02	5/20/23	0950	MW-13-30_052023	GW	3		3						X
.03	5/20/23	1110	MW-13-26_052023	GW	3		3						X
.04	5/20/23	~~1215~~ 1215	PW-14-03_052023	GW	3		3						X
.05	5/20/23	1310	TW-15-11_052023	GW	3		3						X
.06	5/20/23	—	DUP-06_052023	GW	3		3						X
.07	—	—	TRIP BLANK_052023	W	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS ☒ Sampler DATE: 5-20-23 TIME: 1500
RECEIVED BY: SIGNATURE/ORGANIZATION: Anyssa Mundich/Arcadis DATE: 5/22/23 TIME: 0800

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Anyssa Mundich/Arcadis DATE: 5/22/23 TIME: 0835
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcott DATE: 5/22/23 TIME: 0835

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48927.01(01)+QC01
Generated on 06/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48927.01-S48927.02
Project: RACER Lansing 30171056.0470B
Collected Date(s): 05/23/2023
Submitted Date/Time: 05/24/2023 08:15
Sampled by: A. Mandich
P.O. #: US3460008097

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1 (1993)
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-N/NH3 G	Standard Method 4500 N(org)B / 4500 NH3 G 2017
SM4500-PE	Standard Method 4500 P E 2011 / 4500 P B(5) 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48927.01	TW-14-06_052323	Groundwater	05/23/23 11:00
S48927.02	MW-13-29_052323	Groundwater	05/23/23 12:25

Analytical Laboratory Report

Lab Sample ID: S48927.01
Sample Tag: TW-14-06_052323
Collected Date/Time: 05/23/2023 11:00
Matrix: Groundwater
COC Reference: 152809

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.4	IR
1	250ml Plastic	H2SO4	Yes	6.4	IR
1	125ml Plastic	None	Yes	6.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	>2	N/A	05/26/23 10:36	ACK	

Inorganics

Method: E300.0, Run Date: 05/24/23 09:55, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 05/31/23 18:21, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	9.7	0.4		mg/L	1		

Method: SM4500-PE, Run Date: 05/26/23 12:12, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	10	3	2	mg/L	250	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 16:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Lab Sample ID: S48927.02
Sample Tag: MW-13-29_052323
Collected Date/Time: 05/23/2023 12:25
Matrix: Groundwater
COC Reference: 152809

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.4	IR
1	250ml Plastic	H2SO4	Yes	6.4	IR
1	125ml Plastic	None	Yes	6.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Inorganics

Method: E300.0, Run Date: 05/24/23 10:07, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N/NH3 G, Run Date: 05/25/23 17:21, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.468	0.100		mg/L	4		

Method: SM4500-PE, Run Date: 05/26/23 12:21, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.08	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 17:16, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	9	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S48927.01(01)+QC01
Generated on 06/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48927.01-S48927.02
Project: RACER Lansing 30171056.0470B
Submitted Date/Time: 05/24/2023 08:15
Sampled by: A. Mandich
P.O. #: US3460008097

QC Report Sections

Cover Page (Page 8)
Analysis Summary (Pages 9-10)
Prep Batch Summary (Page 11)
Surrogates per QC Sample (Page 12)
Internal Standards per Lab Sample (Pages 13-14)
Internal Standards per QC Sample (Page 15)
Batch QC Results (Pages 16-20)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S48927.01
Sample Tag: TW-14-06_052323
Collected Date/Time: 05/23/2023 11:00
Matrix: Groundwater
COC Reference: 152809

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/24/23 09:55	NTRA230524-W1-A	NTRA230524-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	05/31/23 18:21	TKN230531QC	TKN230531QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	05/26/23 12:12	PHS230526QC	PHS230526QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 16:55	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S48927.02
Sample Tag: MW-13-29_052323
Collected Date/Time: 05/23/2023 12:25
Matrix: Groundwater
COC Reference: 152809

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	05/24/23 10:07	NTRA230524-W1-A	NTRA230524-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 17:21	TKN230525A	TKN230525A	No	BLK/LCS/MS/MSD/DU
Total Phosphorus	SM4500-PE	05/26/23 12:21	PHS230526QC	PHS230526QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	05/25/23 17:16	230525A9	VS230525W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA230524-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48927.01	Nitrate-N	E300.0	05/24/23 09:55	NTRA230524-W1-A
S48927.02	Nitrate-N	E300.0	05/24/23 10:07	NTRA230524-W1-A

Inorganics, Prep Batch ID: PHS230526QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48927.01	Total Phosphorus	SM4500-PE	05/26/23 12:12	PHS230526QC
S48927.02	Total Phosphorus	SM4500-PE	05/26/23 12:21	PHS230526QC

Inorganics, Prep Batch ID: TKN230525A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48927.02	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	05/25/23 17:21	TKN230525A

Inorganics, Prep Batch ID: TKN230531QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48927.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	05/31/23 18:21	TKN230531QC

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48927.01	1,4-Dioxane	SW8260B - SIM	05/25/23 16:55	230525A9
S48927.02	1,4-Dioxane	SW8260B - SIM	05/25/23 17:16	230525A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48927.01

Sample Tag: TW-14-06_052323

Collected Date/Time: 05/23/2023 11:00

Matrix: Groundwater

COC Reference: 152809

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 16:55, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48927.02

Sample Tag: MW-13-29_052323

Collected Date/Time: 05/23/2023 12:25

Matrix: Groundwater

COC Reference: 152809

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230525A9, Run Date: 05/25/2023 17:16, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.5**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230525W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**102.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.7**	50.0	200.0

Inorganics, Prep Batch ID: NTRA230524-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA230524-W1-A.LRB1

Run in Batch: NTRA230524-W1-A, Run Date: 05/24/2023 08:05, Prep Date: 05/24/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA230524-W1-A.LCS1

Run in Batch: NTRA230524-W1-A, Run Date: 05/24/2023 08:27, Prep Date: 05/24/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		94	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA230524-W1-A.MS1, Parent Sample ID: S48858.01

Run in Batch: NTRA230524-W1-A, Run Date: 05/24/2023 09:27, Prep Date: 05/24/2023, Matrix: Liquid, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		103	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA230524-W1-A.MSD1, Parent Sample ID: NTRA230524-W1-A.MS1

Run in Batch: NTRA230524-W1-A, Run Date: 05/24/2023 09:37, Prep Date: 05/24/2023, Matrix: Liquid, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		102	80	120	1	15

Duplicate (DUP)

Lab Sample ID: NTRA230524-W1-A.DP1, Parent Sample ID: S48858.01

Run in Batch: NTRA230524-W1-A, Run Date: 05/24/2023 08:47, Prep Date: 05/24/2023, Matrix: Liquid, Dilution: 10

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS230526QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS230526QC.LRB1

Run in Batch: PHS230526QC, Run Date: 05/26/2023 11:25, Prep Date: 05/26/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS230526QC.LRB2

Run in Batch: PHS230526QC, Run Date: 05/26/2023 11:32, Prep Date: 05/26/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS230526QC.LCS1

Run in Batch: PHS230526QC, Run Date: 05/26/2023 11:39, Prep Date: 05/26/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		95	90	110

Matrix Spike (MS)

Lab Sample ID: PHS230526QC.MS1, Parent Sample ID: S48921.02

Run in Batch: PHS230526QC, Run Date: 05/26/2023 17:33, Prep Date: 05/26/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		98	80	120

Duplicate (DUP)

Lab Sample ID: PHS230526QC.DP1, Parent Sample ID: S48858.01

Run in Batch: PHS230526QC, Run Date: 05/26/2023 17:30, Prep Date: 05/26/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.2	20

Inorganics, Prep Batch ID: TKN230525A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: TKN230525A.LRB1

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:11, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.025	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN230525A.LCS1

Run in Batch: TKN230525A, Run Date: 05/25/2023 15:51, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		102.0	90	110

Matrix Spike (MS)

Lab Sample ID: TKN230525A.MS1, Parent Sample ID: S48714.16

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:43, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		101.3	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: TKN230525A.MSD1, Parent Sample ID: TKN230525A.MS1

Run in Batch: TKN230525A, Run Date: 05/25/2023 16:45, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Total Kjeldahl Nitrogen		99.8	80	120	1	15

Duplicate (DUP)

Lab Sample ID: TKN230525A.DP1, Parent Sample ID: S48879.03

Run in Batch: TKN230525A, Run Date: 05/25/2023 17:15, Prep Date: 05/25/2023, Matrix: Liquid, Dilution: 20

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.3	20

Inorganics, Prep Batch ID: TKN230531QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN230531QC.LRB1

Run in Batch: TKN230531QC, Run Date: 05/31/2023 11:32, Prep Date: 05/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN230531QC.LRB2

Run in Batch: TKN230531QC, Run Date: 05/31/2023 14:00, Prep Date: 05/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN230531QC.LCS1

Run in Batch: TKN230531QC, Run Date: 05/31/2023 14:35, Prep Date: 05/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		98	90	110

Matrix Spike (MS)

Lab Sample ID: TKN230531QC.MS1, Parent Sample ID: S49017.01

Run in Batch: TKN230531QC, Run Date: 05/31/2023 15:04, Prep Date: 05/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103	80	120

Duplicate (DUP)

Lab Sample ID: TKN230531QC.DP1, Parent Sample ID: S49017.01

Run in Batch: TKN230531QC, Run Date: 05/31/2023 14:59, Prep Date: 05/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		0.0	20

Organics - Volatiles, Prep Batch ID: VS230525W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230525A9.BLKS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 12:57, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.54	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 10:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		116.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230525A9.LCSDS25A, Parent Sample ID: 230525A9.LCSS25A

Run in Batch: 230525A9, Run Date: 05/25/2023 11:14, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.3	70.0	130.0	0.7	30.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4882702M, Parent Sample ID: S48827.01

Run in Batch: 230525A9, Run Date: 05/25/2023 20:32, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.5	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 230525A9.4892802M, Parent Sample ID: S48928.01

Run in Batch: 230525A9, Run Date: 05/25/2023 11:34, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4882703N, Parent Sample ID: 230525A9.4882702M

Run in Batch: 230525A9, Run Date: 05/25/2023 20:53, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	7.7	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230525A9.4892803N, Parent Sample ID: 230525A9.4892802M

Run in Batch: 230525A9, Run Date: 05/25/2023 11:55, Prep Date: 05/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		112.0	70.0	130.0	7.6	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48927
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing 30171056.0470B
Submitted: 05/24/2023 08:15 Login User: PFD

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S48927 Submitted: 05/24/2023 08:15
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing 30171056.0470B

Initial Preservation Check: 05/24/2023 09:06 PFD
Preservation Recheck (E200.8): N/A

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S48927.01	250ml Plastic H2SO4	<2			
S48927.02	250ml Plastic H2SO4	<2			

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152809

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 9477775215 CELL NO.: P.O. NO.: US346000 8097
E-MAIL ADDRESS: Kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing 30171056.0470B
SAMPLER(S) - PLEASE PRINT/SIGN NAME: A. Mandich / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-dioxane 8260B-SIMS	Nitrate-N E300	TKN 4500-Norg/NH3	Total P SM4500-PE
48927.01	5/23/23	1100	TW-14-06_052323	GW	5	1	3		1				3	1	1	1
.02	5/23/23	1225	MW-13-29_052323	GW	5	1	3		1				3	1	1	1

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kaitlyn Hunt ☐ Sampler	DATE: 5/23/23	TIME: 1630	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit after hours	DATE: 5/23/23	TIME: 1830	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: 1	DATE: 5/24/23	TIME: 0815	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box Lot 29	DATE: 5/24/23	TIME: 0815	

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 6.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Report ID: S48928.01(01)+QC01
Generated on 06/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

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John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S48928.01-S48928.06
Project: 30171056.0470A / RACER Lansing
Collected Date(s): 05/23/2023
Submitted Date/Time: 05/24/2023 08:15
Sampled by: Kaitlyn Hunt
P.O. #: US3460008097

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S48928.01	MW-04-05(6)_052323	Groundwater	05/23/23 15:20
S48928.02	MW-04-05(6)_052323 MS	Groundwater	05/23/23 15:20
S48928.03	MW-04-05(6)_052323 DUP	Groundwater	05/23/23 15:20
S48928.04	MW-22-152_052323	Groundwater	05/23/23 16:40
S48928.05	DUP-08_052323	Groundwater	05/23/23 00:01
S48928.06	Trip Blank	Groundwater	05/23/23 00:01

Lab Sample ID: S48928.01
Sample Tag: MW-04-05(6)_052323
Collected Date/Time: 05/23/2023 15:20
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 15:24, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48928.01 (continued)
Sample Tag: MW-04-05(6)_052323

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 15:24, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48928.02
Sample Tag: MW-04-05(6)_052323 MS
Collected Date/Time: 05/23/2023 15:20
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Lab Sample ID: S48928.03
Sample Tag: MW-04-05(6)_052323 DUP
Collected Date/Time: 05/23/2023 15:20
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 15:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48928.03 (continued)
Sample Tag: MW-04-05(6)_052323 DUP

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 15:48, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48928.04
Sample Tag: MW-22-152_052323
Collected Date/Time: 05/23/2023 16:40
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 16:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48928.04 (continued)
Sample Tag: MW-22-152_052323

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 16:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48928.05
Sample Tag: DUP-08_052323
Collected Date/Time: 05/23/2023 00:01
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/26/23 10:36	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 16:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S48928.05 (continued)
Sample Tag: DUP-08_052323

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 05/31/23 16:34, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S48928.06
Sample Tag: Trip Blank
Collected Date/Time: 05/23/2023 00:01
Matrix: Groundwater
COC Reference: 168856

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	n/a	n/a	Yes	n/a	n/a

Other / Misc.

Method: , Run Date: 05/25/23 09:30, Analyst: JRM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
No Analyses*	Completed				1		

Quality Control Report

Report ID: S48928.01(01)+QC01
Generated on 06/01/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S48928.01, S48928.03-S48928.05
Project: 30171056.0470A / RACER Lansing
Submitted Date/Time: 05/24/2023 08:15
Sampled by: Kaitlyn Hunt
P.O. #: US3460008097

QC Report Sections

Cover Page (Page 16)
Analysis Summary (Pages 17-20)
Prep Batch Summary (Page 21)
Surrogates per Lab Sample (Pages 22-25)
Surrogates per QC Sample (Page 26)
Internal Standards per Lab Sample (Pages 27-30)
Internal Standards per QC Sample (Page 31)
Batch QC Results (Pages 32-36)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S48928.01
Sample Tag: MW-04-05(6)_052323
Collected Date/Time: 05/23/2023 15:20
Matrix: Groundwater
COC Reference: 168856

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 15:24	230531A7	VF230531W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S48928.03

Sample Tag: MW-04-05(6)_052323 DUP

Collected Date/Time: 05/23/2023 15:20

Matrix: Groundwater

COC Reference: 168856

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 15:48	230531A7	VF230531W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S48928.04
Sample Tag: MW-22-152_052323
Collected Date/Time: 05/23/2023 16:40
Matrix: Groundwater
COC Reference: 168856

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 16:11	230531A7	VF230531W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S48928.05

Sample Tag: DUP-08_052323

Collected Date/Time: 05/23/2023 00:01

Matrix: Groundwater

COC Reference: 168856

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 16:34	230531A7	VF230531W2	Yes	BLK/LCS/LCSD

Organics - Volatiles, Prep Batch ID: VF230531W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S48928.01	Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 15:24	230531A7
S48928.03	Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 15:48	230531A7
S48928.04	Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 16:11	230531A7
S48928.05	Volatile Organics - DEQ List	SW5030C/8260C	05/31/23 16:34	230531A7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48928.01

Sample Tag: MW-04-05(6)_052323

Collected Date/Time: 05/23/2023 15:20

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 15:24, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**115.9**	80.0	124.0
1,2-Dichloroethane-D4		**85.7**	72.0	125.0
Toluene-D8		**97.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48928.03

Sample Tag: MW-04-05(6)_052323 DUP

Collected Date/Time: 05/23/2023 15:20

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 15:48, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**116.2**	80.0	124.0
1,2-Dichloroethane-D4		**88.6**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48928.04

Sample Tag: MW-22-152_052323

Collected Date/Time: 05/23/2023 16:40

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 16:11, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**116.5**	80.0	124.0
1,2-Dichloroethane-D4		**89.1**	72.0	125.0
Toluene-D8		**98.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S48928.05

Sample Tag: DUP-08_052323

Collected Date/Time: 05/23/2023 00:01

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 16:34, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**116.3**	80.0	124.0
1,2-Dichloroethane-D4		**87.6**	72.0	125.0
Toluene-D8		**97.3**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230531W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230531A7.BLKW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 14:14, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**116.9**	80.0	124.0
1,2-Dichloroethane-D4		**88.9**	72.0	125.0
Toluene-D8		**97.6**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 12:40, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**116.1**	80.0	124.0
1,2-Dichloroethane-D4		**90.5**	72.0	125.0
Toluene-D8		**99.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230531A7.LCSDW31A, Parent Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 13:03, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**113.6**	80.0	124.0
1,2-Dichloroethane-D4		**83.2**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

Lab Sample ID: S48928.01

Sample Tag: MW-04-05(6)_052323

Collected Date/Time: 05/23/2023 15:20

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 15:24, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**88.3**	50.0	200.0
1,4-Difluorobenzene		**91.5**	50.0	200.0
Chlorobenzene-D5		**89.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**88.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S48928.03

Sample Tag: MW-04-05(6)_052323 DUP

Collected Date/Time: 05/23/2023 15:20

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 15:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**85.9**	50.0	200.0
1,4-Difluorobenzene		**88.7**	50.0	200.0
Chlorobenzene-D5		**87.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**87.1**	50.0	200.0

Lab Sample ID: S48928.04

Sample Tag: MW-22-152_052323

Collected Date/Time: 05/23/2023 16:40

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 16:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**89.4**	50.0	200.0
1,4-Difluorobenzene		**92.3**	50.0	200.0
Chlorobenzene-D5		**91.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.3**	50.0	200.0

Lab Sample ID: S48928.05

Sample Tag: DUP-08_052323

Collected Date/Time: 05/23/2023 00:01

Matrix: Groundwater

COC Reference: 168856

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230531A7, Run Date: 05/31/2023 16:34, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**87.9**	50.0	200.0
1,4-Difluorobenzene		**91.6**	50.0	200.0
Chlorobenzene-D5		**89.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**89.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230531W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230531A7.BLKW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 14:14, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**90.9**	50.0	200.0
1,4-Difluorobenzene		**93.5**	50.0	200.0
Chlorobenzene-D5		**92.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 12:40, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.5**	50.0	200.0
1,4-Difluorobenzene		**97.3**	50.0	200.0
Chlorobenzene-D5		**97.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.3**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230531A7.LCSDW31A, Parent Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 13:03, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.2**	50.0	200.0
1,4-Difluorobenzene		**92.1**	50.0	200.0
Chlorobenzene-D5		**91.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**89.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230531W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230531A7.BLKW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 14:14, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230531W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230531A7.BLKW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 14:14, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 12:40, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		94.0	67.4	121.2
Acetone		91.1	29.9	161.5
Methyl iodide		110.0	68.8	116.4
Carbon disulfide		112.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		94.9	73.2	122.4
Acrylonitrile		94.9	69.9	128.9
2-Butanone (MEK)		88.5	44.0	134.4
Dichlorodifluoromethane		97.4	10.0	222.8
Chloromethane		89.3	23.8	166.5
Vinyl chloride		92.9	43.5	149.1
Bromomethane		99.9	56.8	151.3
Chloroethane		93.5	53.4	149.4
Trichlorofluoromethane		97.8	59.7	151.8
1,1-Dichloroethene		96.4	69.6	139.4
Methylene chloride		99.3	73.3	121.1
trans-1,2-Dichloroethene		94.7	73.6	129.3
1,1-Dichloroethane		96.5	71.5	126.2
cis-1,2-Dichloroethene		100.2	76.6	122.1
Tetrahydrofuran		86.3	59.0	117.9
Chloroform		98.6	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230531W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 12:40, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		104.9	78.2	120.8
1,1,1-Trichloroethane		101.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.6	71.6	125.2
2-Hexanone		98.3	55.4	136.9
Carbon tetrachloride		106.7	72.6	133.0
Benzene		100.3	79.9	124.9
1,2-Dichloroethane		93.8	76.0	126.3
Trichloroethene		103.3	79.7	124.2
1,2-Dichloropropane		98.3	78.6	126.4
Bromodichloromethane		108.1	80.4	128.2
Dibromomethane		115.2	76.9	122.1
cis-1,3-Dichloropropene		107.4	79.8	129.9
Toluene		102.1	79.8	124.5
trans-1,3-Dichloropropene		106.7	74.0	131.3
1,1,2-Trichloroethane		102.1	78.7	123.1
Tetrachloroethene		108.0	74.5	124.5
trans-1,4-Dichloro-2-butene		106.3	68.6	135.4
Dibromochloromethane		117.0	74.6	127.2
1,2-Dibromoethane		108.9	70.3	133.7
Chlorobenzene		105.1	79.2	122.7
1,1,1,2-Tetrachloroethane		112.0	80.3	128.2
Ethylbenzene		103.5	79.5	129.1
p,m-Xylene		103.8	79.4	132.2
o-Xylene		103.9	80.2	131.0
Styrene		107.3	69.5	126.7
Isopropylbenzene		105.8	74.4	121.5
Bromoform		108.3	69.4	128.0
1,1,2,2-Tetrachloroethane		104.4	79.8	126.3
1,2,3-Trichloropropane		102.9	78.3	138.8
n-Propylbenzene		103.8	82.0	130.7
Bromobenzene		110.3	78.7	124.6
1,3,5-Trimethylbenzene		105.2	81.3	128.9
tert-Butylbenzene		103.5	80.7	128.9
1,2,4-Trimethylbenzene		106.7	81.4	130.8
sec-Butylbenzene		94.9	77.4	129.8
p-Isopropyltoluene		96.4	79.8	137.5
1,3-Dichlorobenzene		97.3	77.0	131.3
1,4-Dichlorobenzene		97.5	20.7	137.7
1,2-Dichlorobenzene		98.5	10.0	166.2
1,2,3-Trimethylbenzene		94.6	76.3	124.2
n-Butylbenzene		95.8	80.0	133.3
Hexachloroethane		102.7	23.8	138.1
1,2-Dibromo-3-chloropropane		95.8	21.2	189.4
1,2,4-Trichlorobenzene		103.8	27.4	143.4
1,2,3-Trichlorobenzene		104.2	75.4	131.4
Naphthalene		101.1	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230531W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 12:40, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		108.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230531A7.LCSDW31A, Parent Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 13:03, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		92.6	67.4	121.2	1.6	30.0
Acetone		91.6	29.9	161.5	0.6	30.0
Methyl iodide		106.8	68.8	116.4	3.0	30.0
Carbon disulfide		110.8	63.8	137.4	1.7	30.0
tert-Methyl butyl ether (MTBE)		93.5	73.2	122.4	1.5	30.0
Acrylonitrile		94.5	69.9	128.9	0.4	30.0
2-Butanone (MEK)		87.0	44.0	134.4	1.7	30.0
Dichlorodifluoromethane		94.9	10.0	222.8	2.6	30.0
Chloromethane		87.7	23.8	166.5	1.9	30.0
Vinyl chloride		92.2	43.5	149.1	0.8	30.0
Bromomethane		96.7	56.8	151.3	3.2	30.0
Chloroethane		91.0	53.4	149.4	2.7	30.0
Trichlorofluoromethane		96.3	59.7	151.8	1.5	30.0
1,1-Dichloroethene		95.8	69.6	139.4	0.6	30.0
Methylene chloride		96.7	73.3	121.1	2.7	30.0
trans-1,2-Dichloroethene		92.4	73.6	129.3	2.4	30.0
1,1-Dichloroethane		94.4	71.5	126.2	2.2	30.0
cis-1,2-Dichloroethene		97.9	76.6	122.1	2.3	30.0
Tetrahydrofuran		84.8	59.0	117.9	1.8	30.0
Chloroform		96.2	78.4	124.0	2.5	30.0
Bromochloromethane		102.3	78.2	120.8	2.5	30.0
1,1,1-Trichloroethane		100.6	79.4	130.9	1.2	30.0
4-Methyl-2-pentanone (MIBK)		101.4	71.6	125.2	0.2	30.0
2-Hexanone		101.2	55.4	136.9	2.9	30.0
Carbon tetrachloride		104.8	72.6	133.0	1.8	30.0
Benzene		98.4	79.9	124.9	1.9	30.0
1,2-Dichloroethane		92.6	76.0	126.3	1.4	30.0
Trichloroethene		102.0	79.7	124.2	1.3	30.0
1,2-Dichloropropane		96.8	78.6	126.4	1.5	30.0
Bromodichloromethane		105.7	80.4	128.2	2.2	30.0
Dibromomethane		115.4	76.9	122.1	0.2	30.0
cis-1,3-Dichloropropene		105.9	79.8	129.9	1.4	30.0
Toluene		100.7	79.8	124.5	1.4	30.0
trans-1,3-Dichloropropene		107.4	74.0	131.3	0.7	30.0
1,1,2-Trichloroethane		103.6	78.7	123.1	1.5	30.0
Tetrachloroethene		107.4	74.5	124.5	0.5	30.0
trans-1,4-Dichloro-2-butene		109.5	68.6	135.4	3.0	30.0
Dibromochloromethane		119.8	74.6	127.2	2.4	30.0
1,2-Dibromoethane		111.4	70.3	133.7	2.3	30.0
Chlorobenzene		104.9	79.2	122.7	0.2	30.0

Organics - Volatiles, Prep Batch ID: VF230531W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230531A7.LCSDW31A, Parent Sample ID: 230531A7.LCSW31A

Run in Batch: 230531A7, Run Date: 05/31/2023 13:03, Prep Date: 05/31/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		111.9	80.3	128.2	0.1	30.0
Ethylbenzene		102.9	79.5	129.1	0.6	30.0
p,m-Xylene		104.3	79.4	132.2	0.5	30.0
o-Xylene		103.9	80.2	131.0	0.0	30.0
Styrene		106.9	69.5	126.7	0.4	30.0
Isopropylbenzene		103.9	74.4	121.5	1.9	30.0
Bromoform		111.4	69.4	128.0	2.8	30.0
1,1,2,2-Tetrachloroethane		107.3	79.8	126.3	2.8	30.0
1,2,3-Trichloropropane		106.2	78.3	138.8	3.1	30.0
n-Propylbenzene		104.3	82.0	130.7	0.5	30.0
Bromobenzene		111.1	78.7	124.6	0.7	30.0
1,3,5-Trimethylbenzene		105.1	81.3	128.9	0.1	30.0
tert-Butylbenzene		103.1	80.7	128.9	0.4	30.0
1,2,4-Trimethylbenzene		106.1	81.4	130.8	0.6	30.0
sec-Butylbenzene		96.5	77.4	129.8	1.6	30.0
p-Isopropyltoluene		97.4	79.8	137.5	1.1	30.0
1,3-Dichlorobenzene		99.6	77.0	131.3	2.3	30.0
1,4-Dichlorobenzene		98.7	20.7	137.7	1.2	30.0
1,2-Dichlorobenzene		100.4	10.0	166.2	2.0	30.0
1,2,3-Trimethylbenzene		96.1	76.3	124.2	1.6	30.0
n-Butylbenzene		96.6	80.0	133.3	0.9	30.0
Hexachloroethane		101.9	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		101.1	21.2	189.4	5.3	30.0
1,2,4-Trichlorobenzene		105.7	27.4	143.4	1.8	30.0
1,2,3-Trichlorobenzene		106.3	75.4	131.4	2.0	30.0
Naphthalene		105.4	32.9	135.8	4.2	30.0
2-Methylnaphthalene		115.1	25.5	165.5	6.2	30.0

Merit Laboratories Login Checklist

Lab Set ID: S48928
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing
Submitted: 05/24/2023 08:15 Login User: PFD

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.4
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

168856

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947 777 5215 CELL NO.: P.O. NO.: —
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0460A/RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kaitlyn Hunt / Kaitlyn Hunt

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260 BSIMS	Special Instructions
48928.01	5/23/23	1520	MW-04-05(6)_052323	GW	6		6						6	MS/MSD * Limited volume
.02	5/23/23	1640	MW-22-152_052323	GW	3		3						3	
.05	5/23/23	—	DUP-08_052323	GW	3		3						3	
.06	5/23/23	—	Trip Blank	W	1								1	Please add Trip Blank

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kaitlyn Hunt	☒ Sampler	DATE: 5/23/23	TIME: 1830
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit After Hours		DATE: 5/23/23	TIME: 1830
RELINQUISHED BY: SIGNATURE/ORGANIZATION:		DATE:	TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION:		DATE:	TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box		DATE: 5/24/23	TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: Pat D		DATE: 5/24/23	TIME: 0815
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL: 6.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER PFAS

Project Number: 30171056

Lot Number:**YE20007**

Date Completed:06/06/2023

06/07/2023 12:53 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YE20007

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Surrogate recovery for the following sample was outside the upper control limit: YE20007-003. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YE20007

Project Name: RACER PFAS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-21-139_051623	Aqueous	05/16/2023 1415	05/20/2023
002	DUP-01_051623	Aqueous	05/16/2023	05/20/2023
003	MW-20-130_051823	Aqueous	05/18/2023 1005	05/20/2023
004	EB-02_051823	Aqueous	05/18/2023 1055	05/20/2023

(4 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YE20007

Project Name: RACER PFAS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-21-139_051623	Aqueous	8:2 FTS	PFAS by ID	54	J	ng/L	6
001	MW-21-139_051623	Aqueous	6:2 FTS	PFAS by ID	46	J	ng/L	6
001	MW-21-139_051623	Aqueous	PFBS	PFAS by ID	15	J	ng/L	6
001	MW-21-139_051623	Aqueous	PFHpS	PFAS by ID	27	J	ng/L	6
001	MW-21-139_051623	Aqueous	PFPeS	PFAS by ID	20	J	ng/L	6
001	MW-21-139_051623	Aqueous	PFHxS	PFAS by ID	250		ng/L	6
001	MW-21-139_051623	Aqueous	PFBA	PFAS by ID	47		ng/L	6
001	MW-21-139_051623	Aqueous	PFHpA	PFAS by ID	76		ng/L	6
001	MW-21-139_051623	Aqueous	PFHxA	PFAS by ID	96		ng/L	6
001	MW-21-139_051623	Aqueous	PFNA	PFAS by ID	27	J	ng/L	6
001	MW-21-139_051623	Aqueous	PFOA	PFAS by ID	91		ng/L	6
001	MW-21-139_051623	Aqueous	PFPeA	PFAS by ID	92		ng/L	6
001	MW-21-139_051623	Aqueous	PFOS	PFAS by ID	1700		ng/L	6
002	DUP-01_051623	Aqueous	8:2 FTS	PFAS by ID	56	J	ng/L	8
002	DUP-01_051623	Aqueous	6:2 FTS	PFAS by ID	48	J	ng/L	8
002	DUP-01_051623	Aqueous	PFBS	PFAS by ID	14	J	ng/L	8
002	DUP-01_051623	Aqueous	PFHpS	PFAS by ID	23	J	ng/L	8
002	DUP-01_051623	Aqueous	PFPeS	PFAS by ID	18	J	ng/L	8
002	DUP-01_051623	Aqueous	PFHxS	PFAS by ID	230		ng/L	8
002	DUP-01_051623	Aqueous	PFBA	PFAS by ID	44		ng/L	8
002	DUP-01_051623	Aqueous	PFDA	PFAS by ID	6.8	J	ng/L	8
002	DUP-01_051623	Aqueous	PFHpA	PFAS by ID	64		ng/L	8
002	DUP-01_051623	Aqueous	PFHxA	PFAS by ID	92		ng/L	8
002	DUP-01_051623	Aqueous	PFNA	PFAS by ID	21	J	ng/L	8
002	DUP-01_051623	Aqueous	PFOA	PFAS by ID	75		ng/L	8
002	DUP-01_051623	Aqueous	PFPeA	PFAS by ID	100		ng/L	8
002	DUP-01_051623	Aqueous	PFOS	PFAS by ID	1600		ng/L	8
003	MW-20-130_051823	Aqueous	PFBS	PFAS by ID	27		ng/L	10
003	MW-20-130_051823	Aqueous	PFPeS	PFAS by ID	7.8		ng/L	10
003	MW-20-130_051823	Aqueous	PFHxS	PFAS by ID	4.8		ng/L	10
003	MW-20-130_051823	Aqueous	PFBA	PFAS by ID	19		ng/L	10
003	MW-20-130_051823	Aqueous	PFHpA	PFAS by ID	9.7		ng/L	10
003	MW-20-130_051823	Aqueous	PFHxA	PFAS by ID	47		ng/L	10
003	MW-20-130_051823	Aqueous	PFOA	PFAS by ID	3.3	J	ng/L	10
003	MW-20-130_051823	Aqueous	PFPeA	PFAS by ID	28		ng/L	10

(35 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-001**

Description: **MW-21-139_051623** Matrix: **Aqueous**

Date Sampled: **05/16/2023 1415** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	5	06/02/2023 1721	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		69	4.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		69	5.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**54**	**J**	**69**	**14**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**46**	**J**	**69**	**17**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		69	7.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		69	18	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		69	4.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		69	6.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		69	8.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**15**	**J**	**34**	**3.6**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		34	6.7	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**27**	**J**	**34**	**4.3**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		34	6.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		34	5.2	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**20**	**J**	**34**	**5.1**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**250**		**34**	**4.7**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**47**		**34**	**5.1**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		34	4.5	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		34	4.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**76**		**34**	**3.8**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**96**		**34**	**5.9**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**27**	**J**	**34**	**4.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**91**		**34**	**7.1**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**92**		**34**	**4.7**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		34	5.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		34	4.5	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		34	5.4	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1700**		**34**	**17**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		85	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		91	25-150
13C7_PFUdA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-001**

Description: **MW-21-139_051623** Matrix: **Aqueous**

Date Sampled: **05/16/2023 1415** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-002**

Description: **DUP-01_051623** Matrix: **Aqueous**

Date Sampled: **05/16/2023** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	5	06/02/2023 1732	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		68	4.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		68	5.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**56**	**J**	**68**	**14**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**48**	**J**	**68**	**17**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		68	7.5	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		68	18	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		68	4.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		68	6.4	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		68	8.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**14**	**J**	**34**	**3.5**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		34	6.6	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**23**	**J**	**34**	**4.3**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		34	6.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		34	5.2	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**18**	**J**	**34**	**5.1**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**230**		**34**	**4.7**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**44**		**34**	**5.1**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**6.8**	**J**	**34**	**4.5**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		34	4.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**64**		**34**	**3.8**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**92**		**34**	**5.9**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**21**	**J**	**34**	**3.9**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**75**		**34**	**7.1**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**100**		**34**	**4.6**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		34	5.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		34	4.5	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		34	5.4	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1600**		**34**	**17**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		123	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		83	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-002**

Description: **DUP-01_051623** Matrix: **Aqueous**

Date Sampled: **05/16/2023** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		79	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-003**

Description: **MW-20-130_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1005** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1743	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**27**		**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**7.8**		**3.5**	**0.53**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.8**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**19**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.7**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**47**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**28**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	381	25-150
13C2_6:2FTS	N	180	25-150
13C2_8:2FTS		106	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		29	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-003**

Description: **MW-20-130_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1005** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		114	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-004**

Description: **EB-02_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1055** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1754	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		104	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20007-004**

Description: **EB-02_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1055** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ76680-001
Batch: 76680
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/02/2023 1648
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/02/2023 1648
8:2 FTS	ND		1	8.0	1.6	ng/L	06/02/2023 1648
6:2 FTS	ND		1	8.0	2.0	ng/L	06/02/2023 1648
4:2 FTS	ND		1	8.0	0.87	ng/L	06/02/2023 1648
GenX	ND		1	8.0	2.1	ng/L	06/02/2023 1648
ADONA	ND		1	8.0	0.48	ng/L	06/02/2023 1648
EtFOSAA	ND		1	8.0	0.75	ng/L	06/02/2023 1648
MeFOSAA	ND		1	8.0	0.93	ng/L	06/02/2023 1648
PFBS	ND		1	4.0	0.41	ng/L	06/02/2023 1648
PFDS	ND		1	4.0	0.78	ng/L	06/02/2023 1648
PFHpS	ND		1	4.0	0.50	ng/L	06/02/2023 1648
PFNS	ND		1	4.0	0.71	ng/L	06/02/2023 1648
PFOSA	ND		1	4.0	0.61	ng/L	06/02/2023 1648
PFPeS	ND		1	4.0	0.59	ng/L	06/02/2023 1648
PFHxS	ND		1	4.0	0.55	ng/L	06/02/2023 1648
PFBA	ND		1	4.0	0.60	ng/L	06/02/2023 1648
PFDA	ND		1	4.0	0.52	ng/L	06/02/2023 1648
PFDoA	ND		1	4.0	0.47	ng/L	06/02/2023 1648
PFHpA	ND		1	4.0	0.45	ng/L	06/02/2023 1648
PFHxA	ND		1	4.0	0.69	ng/L	06/02/2023 1648
PFNA	ND		1	4.0	0.46	ng/L	06/02/2023 1648
PFOA	ND		1	4.0	0.83	ng/L	06/02/2023 1648
PFPeA	ND		1	4.0	0.54	ng/L	06/02/2023 1648
PFTeDA	ND		1	4.0	0.60	ng/L	06/02/2023 1648
PFTrDA	ND		1	4.0	0.53	ng/L	06/02/2023 1648
PFUdA	ND		1	4.0	0.63	ng/L	06/02/2023 1648
PFOS	ND		1	4.0	2.0	ng/L	06/02/2023 1648

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ76680-001
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		96	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76680-002
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	06/02/2023 1659
11Cl-PF3OUdS	15	16		1	106	50-150	06/02/2023 1659
8:2 FTS	15	19		1	125	50-150	06/02/2023 1659
6:2 FTS	15	14		1	92	50-150	06/02/2023 1659
4:2 FTS	15	17		1	116	50-150	06/02/2023 1659
GenX	32	31		1	96	50-150	06/02/2023 1659
ADONA	15	15		1	99	50-150	06/02/2023 1659
EtFOSAA	16	16		1	101	50-150	06/02/2023 1659
MeFOSAA	16	14		1	86	50-150	06/02/2023 1659
PFBS	14	13		1	93	50-150	06/02/2023 1659
PFDS	15	15		1	100	50-150	06/02/2023 1659
PFHpS	15	15		1	99	50-150	06/02/2023 1659
PFNS	15	17		1	112	50-150	06/02/2023 1659
PFOSA	16	15		1	96	50-150	06/02/2023 1659
PFPeS	15	14		1	93	50-150	06/02/2023 1659
PFHxS	15	14		1	99	50-150	06/02/2023 1659
PFBA	16	16		1	100	50-150	06/02/2023 1659
PFDA	16	17		1	104	50-150	06/02/2023 1659
PFDoA	16	16		1	102	50-150	06/02/2023 1659
PFHpA	16	16		1	98	50-150	06/02/2023 1659
PFHxA	16	16		1	99	50-150	06/02/2023 1659
PFNA	16	17		1	105	50-150	06/02/2023 1659
PFOA	16	19		1	117	50-150	06/02/2023 1659
PFPeA	16	16		1	101	50-150	06/02/2023 1659
PFTeDA	16	16		1	98	50-150	06/02/2023 1659
PFTrDA	16	15		1	91	50-150	06/02/2023 1659
PFUdA	16	17		1	103	50-150	06/02/2023 1659
PFOS	15	14		1	97	50-150	06/02/2023 1659

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76680-002
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		87	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ76680-003
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	16		1	108	3.1	50-150	30	06/02/2023 1710
11Cl-PF3OUdS	15	16		1	108	2.1	50-150	30	06/02/2023 1710
8:2 FTS	15	18		1	118	5.9	50-150	30	06/02/2023 1710
6:2 FTS	15	13		1	83	10	50-150	30	06/02/2023 1710
4:2 FTS	15	16		1	105	10	50-150	30	06/02/2023 1710
GenX	32	32		1	100	3.8	50-150	30	06/02/2023 1710
ADONA	15	16		1	105	6.0	50-150	30	06/02/2023 1710
EtFOSAA	16	16		1	102	1.0	50-150	30	06/02/2023 1710
MeFOSAA	16	15		1	93	8.6	50-150	30	06/02/2023 1710
PFBS	14	14		1	97	4.5	50-150	30	06/02/2023 1710
PFDS	15	15		1	99	1.6	50-150	30	06/02/2023 1710
PFHpS	15	15		1	98	1.1	50-150	30	06/02/2023 1710
PFNS	15	16		1	106	5.3	50-150	30	06/02/2023 1710
PFOSA	16	17		1	103	7.2	50-150	30	06/02/2023 1710
PFPeS	15	14		1	95	1.9	50-150	30	06/02/2023 1710
PFHxS	15	15		1	101	2.2	50-150	30	06/02/2023 1710
PFBA	16	16		1	102	2.1	50-150	30	06/02/2023 1710
PFDA	16	16		1	101	2.6	50-150	30	06/02/2023 1710
PFDoA	16	17		1	105	2.9	50-150	30	06/02/2023 1710
PFHpA	16	17		1	104	5.7	50-150	30	06/02/2023 1710
PFHxA	16	15		1	96	2.7	50-150	30	06/02/2023 1710
PFNA	16	17		1	107	1.6	50-150	30	06/02/2023 1710
PFOA	16	16		1	98	18	50-150	30	06/02/2023 1710
PFPeA	16	17		1	104	3.6	50-150	30	06/02/2023 1710
PFTeDA	16	16		1	99	1.5	50-150	30	06/02/2023 1710
PFTrDA	16	16		1	98	7.8	50-150	30	06/02/2023 1710
PFUdA	16	15		1	94	9.0	50-150	30	06/02/2023 1710
PFOS	15	15		1	101	3.7	50-150	30	06/02/2023 1710

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ76680-003
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		98	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Plant 2

Pace Analytical® **Chain of Custody Record**

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

Client	Report to Contact	Telephone No. / E-mail	Quote No.
Arcadis	Tiffany Linder, Kaitlyn Hunt	(248)809-4313/ kaitlyn.hunt@arcadis.com	
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x	Analysis (Attach list if more space is needed)	Page: 1 of 1
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westlund's		Lot # Bar Code (lab use only): YE20007
Project Name: RACER Lansing GWS			
Project Number: 30171056 0370A	P.O. No.: US3460008115		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	Grab G / Composite C	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS (Method 537M, EGLE 28 compounds)								Kit ID:
MW-21-139_051623	5/16/23	1415	G	X			4							4								
DUP-01_051623	5/16/23	—	G	X			4							4								
MW-20-130_051823	5/18/23	1005	G	X			2							2								
EB-02_051823	5/18/23	1055	G	X			2							2								

Turn Around Time Required (Prior lab approval required for expedited TAT)	Sample Disposal	Possible Hazard Identification (List any known hazards in the remarks)	QC Requirements
☒ Standard ☐ Rush (Please Specify)	☐ Return to Client ☒ Disposal by Lab	☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown	

	Date	Time		Date	Time
1. Relinquished by: Arcadis	5-19-23	1700	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by	5/20/23	0900	4. Laboratory Received	5/20/23	0900

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY
Received on Ice (Check) ☒ Y ☐ N ☐ Ice Pack

Receipt Temp. 1.8 °C

Temp. Blank ☐ Y / ☒ N

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: CDR / 5/20/23 Lot #: YE20007

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.8 / 1.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. □
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER PFAS

Project Number: 30171056

Lot Number:**YE20009**

Date Completed:06/10/2023

Kathy Smith

06/12/2023 3:15 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YE20009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Sample YE20009-007 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YE20009-003, YE20009-007, YE20009-010. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside of acceptance limits: YE20009-004. There was insufficient sample to perform a re-extraction; therefore, the data have been reported.

Sample Summary
Arcadis U.S., Inc.
Lot Number: YE20009
Project Name: RACER PFAS
Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-144_051823	Aqueous	05/18/2023 0945	05/20/2023
002	MW-22-145_051823	Aqueous	05/18/2023 1100	05/20/2023
003	MW-22-158_051823	Aqueous	05/18/2023 1300	05/20/2023
004	MW-22-146_051823	Aqueous	05/18/2023 1415	05/20/2023
005	MW-22-160_051823	Aqueous	05/18/2023 1530	05/20/2023
006	EB-01_051823	Aqueous	05/18/2023 1425	05/20/2023
007	MW-22-143_051923	Aqueous	05/19/2023 0930	05/20/2023
008	MW-22-149_051923	Aqueous	05/19/2023 1110	05/20/2023
010	MW-22-147_051923	Aqueous	05/19/2023 1420	05/20/2023

(9 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YE20009

Project Name: RACER PFAS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-144_051823	Aqueous	PFBS	PFAS by ID	2.2	J	ng/L	7
001	MW-22-144_051823	Aqueous	PFHxS	PFAS by ID	3.0	J	ng/L	7
001	MW-22-144_051823	Aqueous	PFBA	PFAS by ID	8.0		ng/L	7
001	MW-22-144_051823	Aqueous	PFHpA	PFAS by ID	6.8		ng/L	7
001	MW-22-144_051823	Aqueous	PFHxA	PFAS by ID	15		ng/L	7
001	MW-22-144_051823	Aqueous	PFOA	PFAS by ID	12		ng/L	7
001	MW-22-144_051823	Aqueous	PFPeA	PFAS by ID	15		ng/L	7
002	MW-22-145_051823	Aqueous	PFBS	PFAS by ID	2.8	J	ng/L	9
002	MW-22-145_051823	Aqueous	PFHpS	PFAS by ID	0.45	J	ng/L	9
002	MW-22-145_051823	Aqueous	PFPeS	PFAS by ID	0.84	J	ng/L	9
002	MW-22-145_051823	Aqueous	PFHxS	PFAS by ID	3.3	J	ng/L	9
002	MW-22-145_051823	Aqueous	PFBA	PFAS by ID	11		ng/L	9
002	MW-22-145_051823	Aqueous	PFHpA	PFAS by ID	15		ng/L	9
002	MW-22-145_051823	Aqueous	PFHxA	PFAS by ID	25		ng/L	9
002	MW-22-145_051823	Aqueous	PFNA	PFAS by ID	1.0	J	ng/L	9
002	MW-22-145_051823	Aqueous	PFOA	PFAS by ID	32		ng/L	9
002	MW-22-145_051823	Aqueous	PFPeA	PFAS by ID	22		ng/L	9
002	MW-22-145_051823	Aqueous	PFOS	PFAS by ID	7.3		ng/L	9
003	MW-22-158_051823	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	11
003	MW-22-158_051823	Aqueous	PFBA	PFAS by ID	4.7		ng/L	11
003	MW-22-158_051823	Aqueous	PFHpA	PFAS by ID	1.5	J	ng/L	11
003	MW-22-158_051823	Aqueous	PFHxA	PFAS by ID	2.8	J	ng/L	11
003	MW-22-158_051823	Aqueous	PFPeA	PFAS by ID	3.0	J	ng/L	11
004	MW-22-146_051823	Aqueous	6:2 FTS	PFAS by ID	13	Q	ng/L	13
004	MW-22-146_051823	Aqueous	PFBS	PFAS by ID	4.8		ng/L	13
004	MW-22-146_051823	Aqueous	PFHxS	PFAS by ID	0.97	J	ng/L	13
004	MW-22-146_051823	Aqueous	PFBA	PFAS by ID	13		ng/L	13
004	MW-22-146_051823	Aqueous	PFHpA	PFAS by ID	0.90	J	ng/L	13
004	MW-22-146_051823	Aqueous	PFHxA	PFAS by ID	3.5		ng/L	13
004	MW-22-146_051823	Aqueous	PFOA	PFAS by ID	4.5		ng/L	13
004	MW-22-146_051823	Aqueous	PFPeA	PFAS by ID	2.9	J	ng/L	13
004	MW-22-146_051823	Aqueous	PFOS	PFAS by ID	3.7		ng/L	13
005	MW-22-160_051823	Aqueous	6:2 FTS	PFAS by ID	6.3	J	ng/L	15
005	MW-22-160_051823	Aqueous	PFBA	PFAS by ID	1.1	J	ng/L	15
007	MW-22-143_051923	Aqueous	PFBS	PFAS by ID	0.79	J	ng/L	19
007	MW-22-143_051923	Aqueous	PFBA	PFAS by ID	11		ng/L	19
007	MW-22-143_051923	Aqueous	PFHpA	PFAS by ID	3.9		ng/L	19
007	MW-22-143_051923	Aqueous	PFHxA	PFAS by ID	14		ng/L	19
007	MW-22-143_051923	Aqueous	PFOA	PFAS by ID	3.7		ng/L	19
007	MW-22-143_051923	Aqueous	PFPeA	PFAS by ID	14		ng/L	19
008	MW-22-149_051923	Aqueous	PFBS	PFAS by ID	0.76	J	ng/L	21
008	MW-22-149_051923	Aqueous	PFHxS	PFAS by ID	0.75	J	ng/L	21
008	MW-22-149_051923	Aqueous	PFNA	PFAS by ID	0.51	J	ng/L	21

Detection Summary (Continued)

Lot Number: YE20009

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
008	MW-22-149_051923	Aqueous	PFOA	PFAS by ID	1.3	J	ng/L	21
010	MW-22-147_051923	Aqueous	PFBS	PFAS by ID	3.0	J	ng/L	23
010	MW-22-147_051923	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	23
010	MW-22-147_051923	Aqueous	PFBA	PFAS by ID	4.8		ng/L	23
010	MW-22-147_051923	Aqueous	PFHpA	PFAS by ID	0.97	J	ng/L	23
010	MW-22-147_051923	Aqueous	PFHxA	PFAS by ID	1.4	J	ng/L	23
010	MW-22-147_051923	Aqueous	PFOA	PFAS by ID	2.7	J	ng/L	23
010	MW-22-147_051923	Aqueous	PFPeA	PFAS by ID	1.3	J	ng/L	23

(51 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-001**

Description: **MW-22-144_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 0945** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1805	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.2**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.0**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.0**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.8**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**12**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**15**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		145	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		69	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-001**

Description: **MW-22-144_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 0945** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-002**

Description: **MW-22-145_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1100** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1816	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.8**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.45**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.84**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.3**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**15**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**25**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.0**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**32**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**22**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.3**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		74	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		99	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-002**

Description: **MW-22-145_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1100** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-003**

Description: **MW-22-158_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1300** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1827	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.7**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.0**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	179	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		65	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-003**

Description: **MW-22-158_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1300** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-004**

Description: **MW-22-146_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1415** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/02/2023 1838	OMNS	06/01/2023 1325	76680

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**13**	**Q**	**7.1**	**1.8**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.8**		**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.97**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.90**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.5**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.7**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	297	25-150
13C2_6:2FTS	N	193	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		71	25-150
13C4_PFBA		30	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		60	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
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Q = Surrogate failure
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-004**

Description: **MW-22-146_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1415** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-005**

Description: **MW-22-160_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1530** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/06/2023 1659	ALM	06/02/2023 1220	76776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**6.3**	**J**	**7.1**	**1.8**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		77	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		102	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-005**

Description: **MW-22-160_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1530** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-006**

Description: **EB-01_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1425** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/06/2023 1710	ALM	06/02/2023 1220	76776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	0.65	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.8	0.86	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	0.73	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	0.91	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.41	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.76	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.70	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.54	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.67	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.9	0.81	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.9	0.53	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.61	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.9	2.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		90	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		91	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-006**

Description: **EB-01_051823** Matrix: **Aqueous**

Date Sampled: **05/18/2023 1425** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	25-150
13C8_PFOS		88	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-007**

Description: **MW-22-143_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 0930** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/06/2023 1742	ALM	06/02/2023 1220	76776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.79**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.9**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**14**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.7**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	161	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-007**

Description: **MW-22-143_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 0930** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-008**

Description: **MW-22-149_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 1110** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/06/2023 1752	ALM	06/02/2023 1220	76776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.76**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.75**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.51**	**J**	**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		100	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-008**

Description: **MW-22-149_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 1110** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-010**

Description: **MW-22-147_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 1420** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/06/2023 1803	ALM	06/02/2023 1220	76776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.8**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.97**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	181	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE20009-010**

Description: **MW-22-147_051923** Matrix: **Aqueous**

Date Sampled: **05/19/2023 1420** Project Name: **RACER PFAS**

Date Received: **05/20/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ76680-001
Batch: 76680
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/02/2023 1648
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/02/2023 1648
8:2 FTS	ND		1	8.0	1.6	ng/L	06/02/2023 1648
6:2 FTS	ND		1	8.0	2.0	ng/L	06/02/2023 1648
4:2 FTS	ND		1	8.0	0.87	ng/L	06/02/2023 1648
GenX	ND		1	8.0	2.1	ng/L	06/02/2023 1648
ADONA	ND		1	8.0	0.48	ng/L	06/02/2023 1648
EtFOSAA	ND		1	8.0	0.75	ng/L	06/02/2023 1648
MeFOSAA	ND		1	8.0	0.93	ng/L	06/02/2023 1648
PFBS	ND		1	4.0	0.41	ng/L	06/02/2023 1648
PFDS	ND		1	4.0	0.78	ng/L	06/02/2023 1648
PFHpS	ND		1	4.0	0.50	ng/L	06/02/2023 1648
PFNS	ND		1	4.0	0.71	ng/L	06/02/2023 1648
PFOSA	ND		1	4.0	0.61	ng/L	06/02/2023 1648
PFPeS	ND		1	4.0	0.59	ng/L	06/02/2023 1648
PFHxS	ND		1	4.0	0.55	ng/L	06/02/2023 1648
PFBA	ND		1	4.0	0.60	ng/L	06/02/2023 1648
PFDA	ND		1	4.0	0.52	ng/L	06/02/2023 1648
PFDoA	ND		1	4.0	0.47	ng/L	06/02/2023 1648
PFHpA	ND		1	4.0	0.45	ng/L	06/02/2023 1648
PFHxA	ND		1	4.0	0.69	ng/L	06/02/2023 1648
PFNA	ND		1	4.0	0.46	ng/L	06/02/2023 1648
PFOA	ND		1	4.0	0.83	ng/L	06/02/2023 1648
PFPeA	ND		1	4.0	0.54	ng/L	06/02/2023 1648
PFTeDA	ND		1	4.0	0.60	ng/L	06/02/2023 1648
PFTrDA	ND		1	4.0	0.53	ng/L	06/02/2023 1648
PFUdA	ND		1	4.0	0.63	ng/L	06/02/2023 1648
PFOS	ND		1	4.0	2.0	ng/L	06/02/2023 1648

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ76680-001
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		96	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76680-002
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	06/02/2023 1659
11Cl-PF3OUdS	15	16		1	106	50-150	06/02/2023 1659
8:2 FTS	15	19		1	125	50-150	06/02/2023 1659
6:2 FTS	15	14		1	92	50-150	06/02/2023 1659
4:2 FTS	15	17		1	116	50-150	06/02/2023 1659
GenX	32	31		1	96	50-150	06/02/2023 1659
ADONA	15	15		1	99	50-150	06/02/2023 1659
EtFOSAA	16	16		1	101	50-150	06/02/2023 1659
MeFOSAA	16	14		1	86	50-150	06/02/2023 1659
PFBS	14	13		1	93	50-150	06/02/2023 1659
PFDS	15	15		1	100	50-150	06/02/2023 1659
PFHpS	15	15		1	99	50-150	06/02/2023 1659
PFNS	15	17		1	112	50-150	06/02/2023 1659
PFOSA	16	15		1	96	50-150	06/02/2023 1659
PFPeS	15	14		1	93	50-150	06/02/2023 1659
PFHxS	15	14		1	99	50-150	06/02/2023 1659
PFBA	16	16		1	100	50-150	06/02/2023 1659
PFDA	16	17		1	104	50-150	06/02/2023 1659
PFDoA	16	16		1	102	50-150	06/02/2023 1659
PFHpA	16	16		1	98	50-150	06/02/2023 1659
PFHxA	16	16		1	99	50-150	06/02/2023 1659
PFNA	16	17		1	105	50-150	06/02/2023 1659
PFOA	16	19		1	117	50-150	06/02/2023 1659
PFPeA	16	16		1	101	50-150	06/02/2023 1659
PFTeDA	16	16		1	98	50-150	06/02/2023 1659
PFTrDA	16	15		1	91	50-150	06/02/2023 1659
PFUdA	16	17		1	103	50-150	06/02/2023 1659
PFOS	15	14		1	97	50-150	06/02/2023 1659

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76680-002
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		87	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ76680-003
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	16		1	108	3.1	50-150	30	06/02/2023 1710
11Cl-PF3OUdS	15	16		1	108	2.1	50-150	30	06/02/2023 1710
8:2 FTS	15	18		1	118	5.9	50-150	30	06/02/2023 1710
6:2 FTS	15	13		1	83	10	50-150	30	06/02/2023 1710
4:2 FTS	15	16		1	105	10	50-150	30	06/02/2023 1710
GenX	32	32		1	100	3.8	50-150	30	06/02/2023 1710
ADONA	15	16		1	105	6.0	50-150	30	06/02/2023 1710
EtFOSAA	16	16		1	102	1.0	50-150	30	06/02/2023 1710
MeFOSAA	16	15		1	93	8.6	50-150	30	06/02/2023 1710
PFBS	14	14		1	97	4.5	50-150	30	06/02/2023 1710
PFDS	15	15		1	99	1.6	50-150	30	06/02/2023 1710
PFHpS	15	15		1	98	1.1	50-150	30	06/02/2023 1710
PFNS	15	16		1	106	5.3	50-150	30	06/02/2023 1710
PFOSA	16	17		1	103	7.2	50-150	30	06/02/2023 1710
PFPeS	15	14		1	95	1.9	50-150	30	06/02/2023 1710
PFHxS	15	15		1	101	2.2	50-150	30	06/02/2023 1710
PFBA	16	16		1	102	2.1	50-150	30	06/02/2023 1710
PFDA	16	16		1	101	2.6	50-150	30	06/02/2023 1710
PFDoA	16	17		1	105	2.9	50-150	30	06/02/2023 1710
PFHpA	16	17		1	104	5.7	50-150	30	06/02/2023 1710
PFHxA	16	15		1	96	2.7	50-150	30	06/02/2023 1710
PFNA	16	17		1	107	1.6	50-150	30	06/02/2023 1710
PFOA	16	16		1	98	18	50-150	30	06/02/2023 1710
PFPeA	16	17		1	104	3.6	50-150	30	06/02/2023 1710
PFTeDA	16	16		1	99	1.5	50-150	30	06/02/2023 1710
PFTrDA	16	16		1	98	7.8	50-150	30	06/02/2023 1710
PFUdA	16	15		1	94	9.0	50-150	30	06/02/2023 1710
PFOS	15	15		1	101	3.7	50-150	30	06/02/2023 1710

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ76680-003
Batch: 76680
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2023 1325

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		98	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ76776-001
Batch: 76776
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/02/2023 1220

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/06/2023 1638
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/06/2023 1638
8:2 FTS	ND		1	8.0	1.6	ng/L	06/06/2023 1638
6:2 FTS	ND		1	8.0	2.0	ng/L	06/06/2023 1638
4:2 FTS	ND		1	8.0	0.87	ng/L	06/06/2023 1638
GenX	ND		1	8.0	2.1	ng/L	06/06/2023 1638
ADONA	ND		1	8.0	0.48	ng/L	06/06/2023 1638
EtFOSAA	ND		1	8.0	0.75	ng/L	06/06/2023 1638
MeFOSAA	ND		1	8.0	0.93	ng/L	06/06/2023 1638
PFBS	ND		1	4.0	0.41	ng/L	06/06/2023 1638
PFDS	ND		1	4.0	0.78	ng/L	06/06/2023 1638
PFHpS	ND		1	4.0	0.50	ng/L	06/06/2023 1638
PFNS	ND		1	4.0	0.71	ng/L	06/06/2023 1638
PFOSA	ND		1	4.0	0.61	ng/L	06/06/2023 1638
PFPeS	ND		1	4.0	0.59	ng/L	06/06/2023 1638
PFHxS	ND		1	4.0	0.55	ng/L	06/06/2023 1638
PFBA	ND		1	4.0	0.60	ng/L	06/06/2023 1638
PFDA	ND		1	4.0	0.52	ng/L	06/06/2023 1638
PFDoA	ND		1	4.0	0.47	ng/L	06/06/2023 1638
PFHpA	ND		1	4.0	0.45	ng/L	06/06/2023 1638
PFHxA	ND		1	4.0	0.69	ng/L	06/06/2023 1638
PFNA	ND		1	4.0	0.46	ng/L	06/06/2023 1638
PFOA	ND		1	4.0	0.83	ng/L	06/06/2023 1638
PFPeA	ND		1	4.0	0.54	ng/L	06/06/2023 1638
PFTeDA	ND		1	4.0	0.60	ng/L	06/06/2023 1638
PFTrDA	ND		1	4.0	0.53	ng/L	06/06/2023 1638
PFUdA	ND		1	4.0	0.63	ng/L	06/06/2023 1638
PFOS	ND		1	4.0	2.0	ng/L	06/06/2023 1638

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		107	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		99	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		97	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ76776-001
Batch: 76776
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/02/2023 1220

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		98	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76776-002
Batch: 76776
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/02/2023 1220

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	50-150	06/06/2023 1649
11Cl-PF3OUdS	15	15		1	102	50-150	06/06/2023 1649
8:2 FTS	15	13		1	86	50-150	06/06/2023 1649
6:2 FTS	15	17		1	112	50-150	06/06/2023 1649
4:2 FTS	15	16		1	108	50-150	06/06/2023 1649
GenX	32	32		1	99	50-150	06/06/2023 1649
ADONA	15	17		1	112	50-150	06/06/2023 1649
EtFOSAA	16	16		1	100	50-150	06/06/2023 1649
MeFOSAA	16	15		1	94	50-150	06/06/2023 1649
PFBS	14	14		1	101	50-150	06/06/2023 1649
PFDS	15	15		1	99	50-150	06/06/2023 1649
PFHpS	15	17		1	114	50-150	06/06/2023 1649
PFNS	15	16		1	104	50-150	06/06/2023 1649
PFOSA	16	17		1	105	50-150	06/06/2023 1649
PFPeS	15	15		1	101	50-150	06/06/2023 1649
PFHxS	15	17		1	115	50-150	06/06/2023 1649
PFBA	16	17		1	105	50-150	06/06/2023 1649
PFDA	16	16		1	102	50-150	06/06/2023 1649
PFDoA	16	17		1	104	50-150	06/06/2023 1649
PFHpA	16	16		1	100	50-150	06/06/2023 1649
PFHxA	16	16		1	100	50-150	06/06/2023 1649
PFNA	16	17		1	109	50-150	06/06/2023 1649
PFOA	16	16		1	99	50-150	06/06/2023 1649
PFPeA	16	16		1	98	50-150	06/06/2023 1649
PFTeDA	16	16		1	102	50-150	06/06/2023 1649
PFTrDA	16	15		1	91	50-150	06/06/2023 1649
PFUdA	16	17		1	106	50-150	06/06/2023 1649
PFOS	15	16		1	111	50-150	06/06/2023 1649

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		96	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ76776-002
Batch: 76776
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/02/2023 1220

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		103	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Plant 6

Pace Analytical™ **Chain of Custody Record**

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: CDR / 5/20/23 Lot #: YE20009

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.8 / 1.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Kaitlyn Hunt

Project Name: RACER PFAS

Project Number: 30171056

Lot Number:**YE26004**

Date Completed:06/26/2023

06/27/2023 9:48 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YE26004

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18, PFAS by Isotope Dilution SOP.

Pace is a DoD/DoE and TNI accredited laboratory; however, Pace is not accredited for PFAS Direct Aqueous Injection or Method D8421.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YE26004-004, YE26004-007, YE26004-011 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YE26004-002, YE26004-003, YE26004-005, YE26004-006, YE26004-007, YE26004-008, YE26004-009, YE26004-010, YE26004-011. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: YE26004-004. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary
Arcadis U.S., Inc.
Lot Number: YE26004
Project Name: RACER PFAS
Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-18-100_052323	Aqueous	05/23/2023 1005	05/26/2023
002	MW-18-99_052323	Aqueous	05/23/2023 1230	05/26/2023
003	MW-18-98_052323	Aqueous	05/23/2023 1350	05/26/2023
004	MW-18-101_052323	Aqueous	05/23/2023 1345	05/26/2023
005	MW-19-111_052423	Aqueous	05/24/2023 1420	05/26/2023
006	MW-18-88_052423	Aqueous	05/24/2023 1435	05/26/2023
007	MW-19-108_052423	Aqueous	05/24/2023 1530	05/26/2023
008	UNK-15_052423	Aqueous	05/24/2023 1555	05/26/2023
009	MW-18-95_052423	Aqueous	05/24/2023 1655	05/26/2023
010	DUP-04_052323	Aqueous	05/23/2023	05/26/2023
011	MW-19-107_052423	Aqueous	05/24/2023 1635	05/26/2023
012	MW-18-105_052423	Aqueous	05/24/2023 1735	05/26/2023

(12 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YE26004

Project Name: RACER PFAS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-18-100_052323	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	10
001	MW-18-100_052323	Aqueous	PFHxS	PFAS by ID	2.0	J	ng/L	10
001	MW-18-100_052323	Aqueous	PFBA	PFAS by ID	11		ng/L	10
001	MW-18-100_052323	Aqueous	PFHpA	PFAS by ID	1.8	J	ng/L	10
001	MW-18-100_052323	Aqueous	PFHxA	PFAS by ID	4.6		ng/L	10
001	MW-18-100_052323	Aqueous	PFOA	PFAS by ID	2.4	J	ng/L	10
001	MW-18-100_052323	Aqueous	PFPeA	PFAS by ID	3.0	J	ng/L	10
002	MW-18-99_052323	Aqueous	PFBS	PFAS by ID	0.54	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFHpS	PFAS by ID	0.72	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFBA	PFAS by ID	11		ng/L	12
002	MW-18-99_052323	Aqueous	PFDA	PFAS by ID	0.90	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFHpA	PFAS by ID	1.8	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFHxA	PFAS by ID	3.5	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFNA	PFAS by ID	1.1	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFOA	PFAS by ID	3.9		ng/L	12
002	MW-18-99_052323	Aqueous	PFPeA	PFAS by ID	1.8	J	ng/L	12
002	MW-18-99_052323	Aqueous	PFOS	PFAS by ID	57		ng/L	12
003	MW-18-98_052323	Aqueous	PFBS	PFAS by ID	0.50	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFHxS	PFAS by ID	0.51	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFBA	PFAS by ID	4.5		ng/L	14
003	MW-18-98_052323	Aqueous	PFHpA	PFAS by ID	1.2	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFHxA	PFAS by ID	1.8	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFNA	PFAS by ID	3.4	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFOA	PFAS by ID	3.1	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFPeA	PFAS by ID	0.75	J	ng/L	14
003	MW-18-98_052323	Aqueous	PFOS	PFAS by ID	250		ng/L	14
004	MW-18-101_052323	Aqueous	PFBA	PFAS by ID	4.0		ng/L	16
004	MW-18-101_052323	Aqueous	PFPeA	PFAS by ID	0.64	J	ng/L	16
005	MW-19-111_052423	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	18
005	MW-19-111_052423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	18
005	MW-19-111_052423	Aqueous	PFBA	PFAS by ID	3.0	J	ng/L	18
005	MW-19-111_052423	Aqueous	PFHpA	PFAS by ID	0.83	J	ng/L	18
005	MW-19-111_052423	Aqueous	PFHxA	PFAS by ID	1.9	J	ng/L	18
005	MW-19-111_052423	Aqueous	PFOA	PFAS by ID	5.0		ng/L	18
005	MW-19-111_052423	Aqueous	PFPeA	PFAS by ID	1.3	J	ng/L	18
006	MW-18-88_052423	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	20
006	MW-18-88_052423	Aqueous	PFHpS	PFAS by ID	2.1	J	ng/L	20
006	MW-18-88_052423	Aqueous	PFPeS	PFAS by ID	0.59	J	ng/L	20
006	MW-18-88_052423	Aqueous	PFHxS	PFAS by ID	4.1		ng/L	20
006	MW-18-88_052423	Aqueous	PFBA	PFAS by ID	10		ng/L	20
006	MW-18-88_052423	Aqueous	PFHpA	PFAS by ID	0.65	J	ng/L	20
006	MW-18-88_052423	Aqueous	PFHxA	PFAS by ID	0.70	J	ng/L	20

Detection Summary (Continued)

Lot Number: YE26004

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	MW-18-88_052423	Aqueous	PFNA	PFAS by ID	0.53	J	ng/L	20
006	MW-18-88_052423	Aqueous	PFOA	PFAS by ID	6.8		ng/L	20
006	MW-18-88_052423	Aqueous	PFOS	PFAS by ID	200		ng/L	20
007	MW-19-108_052423	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	22
007	MW-19-108_052423	Aqueous	PFHxS	PFAS by ID	0.89	J	ng/L	22
007	MW-19-108_052423	Aqueous	PFBA	PFAS by ID	1.9	J	ng/L	22
007	MW-19-108_052423	Aqueous	PFHpA	PFAS by ID	0.64	J	ng/L	22
007	MW-19-108_052423	Aqueous	PFHxA	PFAS by ID	0.86	J	ng/L	22
007	MW-19-108_052423	Aqueous	PFOA	PFAS by ID	4.1		ng/L	22
007	MW-19-108_052423	Aqueous	PFOS	PFAS by ID	5.5		ng/L	22
008	UNK-15_052423	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	24
008	UNK-15_052423	Aqueous	PFHpS	PFAS by ID	12		ng/L	24
008	UNK-15_052423	Aqueous	PFPeS	PFAS by ID	2.1	J	ng/L	24
008	UNK-15_052423	Aqueous	PFHxS	PFAS by ID	15		ng/L	24
008	UNK-15_052423	Aqueous	PFBA	PFAS by ID	15		ng/L	24
008	UNK-15_052423	Aqueous	PFDA	PFAS by ID	4.3		ng/L	24
008	UNK-15_052423	Aqueous	PFHpA	PFAS by ID	6.2		ng/L	24
008	UNK-15_052423	Aqueous	PFHxA	PFAS by ID	9.9		ng/L	24
008	UNK-15_052423	Aqueous	PFNA	PFAS by ID	5.3		ng/L	24
008	UNK-15_052423	Aqueous	PFOA	PFAS by ID	26		ng/L	24
008	UNK-15_052423	Aqueous	PFPeA	PFAS by ID	11		ng/L	24
008	UNK-15_052423	Aqueous	PFOS	PFAS by ID	940		ng/L	24
009	MW-18-95_052423	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFHpS	PFAS by ID	0.50	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFHxS	PFAS by ID	0.76	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFBA	PFAS by ID	3.6	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFHpA	PFAS by ID	0.51	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFNA	PFAS by ID	0.80	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFOA	PFAS by ID	3.1	J	ng/L	26
009	MW-18-95_052423	Aqueous	PFOS	PFAS by ID	35		ng/L	26
010	DUP-04_052323	Aqueous	PFBS	PFAS by ID	0.51	J	ng/L	28
010	DUP-04_052323	Aqueous	PFHxS	PFAS by ID	0.54	J	ng/L	28
010	DUP-04_052323	Aqueous	PFBA	PFAS by ID	4.6		ng/L	28
010	DUP-04_052323	Aqueous	PFHpA	PFAS by ID	1.2	J	ng/L	28
010	DUP-04_052323	Aqueous	PFHxA	PFAS by ID	1.5	J	ng/L	28
010	DUP-04_052323	Aqueous	PFNA	PFAS by ID	3.3	J	ng/L	28
010	DUP-04_052323	Aqueous	PFOA	PFAS by ID	2.9	J	ng/L	28
010	DUP-04_052323	Aqueous	PFPeA	PFAS by ID	0.74	J	ng/L	28
010	DUP-04_052323	Aqueous	PFOS	PFAS by ID	250		ng/L	28
011	MW-19-107_052423	Aqueous	ADONA	PFAS by ID	0.45	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFHxS	PFAS by ID	4.4		ng/L	30
011	MW-19-107_052423	Aqueous	PFBA	PFAS by ID	2.3	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFHpA	PFAS by ID	0.50	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFHxA	PFAS by ID	0.67	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFOA	PFAS by ID	2.6	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFPeA	PFAS by ID	0.52	J	ng/L	30
011	MW-19-107_052423	Aqueous	PFOS	PFAS by ID	2.0	J	ng/L	30

Detection Summary (Continued)

Lot Number: YE26004

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
012	MW-18-105_052423	Aqueous	PFBS	PFAS by ID	3.1	J	ng/L	32
012	MW-18-105_052423	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	32
012	MW-18-105_052423	Aqueous	PFBA	PFAS by ID	1.1	J	ng/L	32
012	MW-18-105_052423	Aqueous	PFOS	PFAS by ID	4.9		ng/L	32

(95 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-001**

Description: **MW-18-100_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1005** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/14/2023 1950	ARC2	06/13/2023 1818	77537

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.0**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.6**		**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.4**	**J**	**3.6**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.0**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		92	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		112	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-001**

Description: **MW-18-100_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1005** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		109	25-150
d3-MeFOSAA		116	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
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Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-002**

Description: **MW-18-99_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1230** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/14/2023 2002	ARC2	06/13/2023 1818	77537

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.54**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.72**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.90**	**J**	**3.6**	**0.48**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.5**	**J**	**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.9**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**57**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	161	25-150
13C2_6:2FTS		148	25-150
13C2_8:2FTS		133	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		106	25-150
13C7_PFUdA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-002**

Description: **MW-18-99_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1230** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		108	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		123	25-150
d3-MeFOSAA		132	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-003**

Description: **MW-18-98_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1350** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 1807	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.50**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.51**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.5**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.4**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.75**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**250**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	288	25-150
13C2_6:2FTS	N	195	25-150
13C2_8:2FTS		131	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		52	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		91	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-003**

Description: **MW-18-98_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1350** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-004**

Description: **MW-18-101_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1345** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 1845	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.0**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	Q	3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.76	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.64**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	Q	3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		134	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA	N	7.4	25-150
13C2_PFTeDA	N	0.20	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		67	25-150
13C7_PFUdA		28	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-004**

Description: **MW-18-101_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1345** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		86	25-150
13C8_PFOSA		11	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		37	25-150
d3-MeFOSAA		53	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-005**

Description: **MW-19-111_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1420** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 1858	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.52**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.0**	**J**	**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.83**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.59	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	209	25-150
13C2_6:2FTS		112	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		109	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		33	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-005**

Description: **MW-19-111_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1420** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		106	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-006**

Description: **MW-18-88_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1435** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 1936	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.1**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.59**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.1**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.65**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.70**	**J**	**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.53**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.8**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**200**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	260	25-150
13C2_6:2FTS		150	25-150
13C2_8:2FTS		119	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		46	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-006**

Description: **MW-18-88_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1435** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-007**

Description: **MW-19-108_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1530** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 1949	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.7	0.84	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	0.72	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	0.90	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.9**	**0.40**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.75	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.57	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.89**	**J**	**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.9**	**0.58**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.64**	**J**	**3.9**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.86**	**J**	**3.9**	**0.66**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.1**		**3.9**	**0.80**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.5**		**3.9**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	263	25-150
13C2_6:2FTS		126	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		51	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		31	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-007**

Description: **MW-19-108_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1530** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-008**

Description: **UNK-15_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1555** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2002	ARC2	06/14/2023 1002	77582
2	SOP SPE	PFAS by ID SOP	5	06/23/2023 1330	OMNS	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**12**		**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**2.1**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**15**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.3**		**3.6**	**0.48**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.2**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.9**		**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.3**		**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**		**3.6**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**11**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**940**		**18**	**9.1**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	356	25-150	N	201	25-150
13C2_6:2FTS	N	210	25-150		128	25-150
13C2_8:2FTS	N	174	25-150		123	25-150
13C2_PFDoA		96	25-150		91	25-150
13C2_PFTeDA		89	25-150		88	25-150
13C3_PFBS		86	25-150		105	25-150
13C3_PFHxS		101	25-150		115	25-150
13C3-HFPO-DA		89	25-150		106	25-150
13C4_PFBA		40	25-150		94	25-150
13C4_PFHpA		98	25-150		97	25-150
13C5_PFHxA		95	25-150		109	25-150
13C5_PFPeA		75	25-150		107	25-150
13C6_PFDA		96	25-150		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-008**

Description: **UNK-15_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1555** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		97	25-150		90	25-150
13C8_PFOA		91	25-150		103	25-150
13C8_PFOS		95	25-150		118	25-150
13C8_PFOSA		104	10-150		110	10-150
13C9_PFNA		100	25-150		115	25-150
d5-EtFOSAA		108	25-150		92	25-150
d3-MeFOSAA		111	25-150		93	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-009**

Description: **MW-18-95_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1655** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2015	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.50**	**J**	**3.7**	**0.46**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.76**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.6**	**J**	**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.51**	**J**	**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.80**	**J**	**3.7**	**0.43**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**35**		**3.7**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	384	25-150
13C2_6:2FTS	N	257	25-150
13C2_8:2FTS	N	192	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		37	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-009**

Description: **MW-18-95_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1655** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-010**

Description: **DUP-04_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2027	ARC2	06/14/2023 1002	77582

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.51**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.54**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.6**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.5**	**J**	**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.9**	**J**	**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.74**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**250**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	293	25-150
13C2_6:2FTS	N	172	25-150
13C2_8:2FTS		140	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		112	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		51	25-150
13C4_PFHpA		110	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		91	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-010**

Description: **DUP-04_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-011**

Description: **MW-19-107_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1635** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 1904	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	**919005-14-4**	**PFAS by ID SOP**	**0.45**	**J**	**7.5**	**0.45**	**ng/L**	**1**
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.71	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.88	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.8**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.67	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.58	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.56	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.4**		**3.8**	**0.52**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.3**	**J**	**3.8**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.8	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.50**	**J**	**3.8**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.67**	**J**	**3.8**	**0.65**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.8	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.6**	**J**	**3.8**	**0.78**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.52**	**J**	**3.8**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.59	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.0**	**J**	**3.8**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		65	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-011**

Description: **MW-19-107_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1635** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-012**

Description: **MW-18-105_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1735** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 1916	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.1**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.9**		**3.7**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		128	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		111	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		101	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE26004-012**

Description: **MW-18-105_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1735** Project Name: **RACER PFAS**

Date Received: **05/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ77537-001
Batch: 77537
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/13/2023 1818

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/15/2023 1353
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/15/2023 1353
8:2 FTS	ND		1	8.0	1.6	ng/L	06/15/2023 1353
6:2 FTS	ND		1	8.0	2.0	ng/L	06/15/2023 1353
4:2 FTS	ND		1	8.0	0.87	ng/L	06/15/2023 1353
GenX	ND		1	8.0	2.1	ng/L	06/15/2023 1353
ADONA	ND		1	8.0	0.48	ng/L	06/15/2023 1353
EtFOSAA	ND		1	8.0	0.75	ng/L	06/15/2023 1353
MeFOSAA	ND		1	8.0	0.93	ng/L	06/15/2023 1353
PFBS	ND		1	4.0	0.41	ng/L	06/15/2023 1353
PFDS	ND		1	4.0	0.78	ng/L	06/15/2023 1353
PFHpS	ND		1	4.0	0.50	ng/L	06/15/2023 1353
PFNS	ND		1	4.0	0.71	ng/L	06/15/2023 1353
PFOSA	ND		1	4.0	0.61	ng/L	06/15/2023 1353
PFPeS	ND		1	4.0	0.59	ng/L	06/15/2023 1353
PFHxS	ND		1	4.0	0.55	ng/L	06/15/2023 1353
PFBA	ND		1	4.0	0.60	ng/L	06/15/2023 1353
PFDA	ND		1	4.0	0.52	ng/L	06/15/2023 1353
PFDoA	ND		1	4.0	0.47	ng/L	06/15/2023 1353
PFHpA	ND		1	4.0	0.45	ng/L	06/15/2023 1353
PFHxA	ND		1	4.0	0.69	ng/L	06/15/2023 1353
PFNA	ND		1	4.0	0.46	ng/L	06/15/2023 1353
PFOA	ND		1	4.0	0.83	ng/L	06/15/2023 1353
PFPeA	ND		1	4.0	0.54	ng/L	06/15/2023 1353
PFTeDA	ND		1	4.0	0.60	ng/L	06/15/2023 1353
PFTrDA	ND		1	4.0	0.53	ng/L	06/15/2023 1353
PFUdA	ND		1	4.0	0.63	ng/L	06/15/2023 1353
PFOS	ND		1	4.0	2.0	ng/L	06/15/2023 1353

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		106	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		104	25-150
13C4_PFBA		105	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77537-001
Batch: 77537
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/13/2023 1818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		102	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77537-002
Batch: 77537
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/13/2023 1818

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	50-150	06/15/2023 1405
11Cl-PF3OUdS	15	13		1	84	50-150	06/15/2023 1405
8:2 FTS	15	15		1	96	50-150	06/15/2023 1405
6:2 FTS	15	13		1	88	50-150	06/15/2023 1405
4:2 FTS	15	15		1	99	50-150	06/15/2023 1405
GenX	32	31		1	98	50-150	06/15/2023 1405
ADONA	15	14		1	96	50-150	06/15/2023 1405
EtFOSAA	16	16		1	102	50-150	06/15/2023 1405
MeFOSAA	16	16		1	99	50-150	06/15/2023 1405
PFBS	14	14		1	96	50-150	06/15/2023 1405
PFDS	15	13		1	85	50-150	06/15/2023 1405
PFHpS	15	15		1	99	50-150	06/15/2023 1405
PFNS	15	14		1	92	50-150	06/15/2023 1405
PFOSA	16	15		1	95	50-150	06/15/2023 1405
PFPeS	15	14		1	92	50-150	06/15/2023 1405
PFHxS	15	14		1	98	50-150	06/15/2023 1405
PFBA	16	16		1	100	50-150	06/15/2023 1405
PFDA	16	16		1	98	50-150	06/15/2023 1405
PFDoA	16	16		1	102	50-150	06/15/2023 1405
PFHpA	16	16		1	101	50-150	06/15/2023 1405
PFHxA	16	16		1	101	50-150	06/15/2023 1405
PFNA	16	16		1	98	50-150	06/15/2023 1405
PFOA	16	15		1	96	50-150	06/15/2023 1405
PFPeA	16	16		1	98	50-150	06/15/2023 1405
PFTeDA	16	16		1	97	50-150	06/15/2023 1405
PFTrDA	16	16		1	102	50-150	06/15/2023 1405
PFUdA	16	17		1	105	50-150	06/15/2023 1405
PFOS	15	15		1	103	50-150	06/15/2023 1405

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		103	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77537-002
Batch: 77537
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/13/2023 1818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		101	25-150
13C7_PFUdA		96	25-150
13C8_PFOA		104	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77582-001
Batch: 77582
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/21/2023 1741
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/21/2023 1741
8:2 FTS	ND		1	8.0	1.6	ng/L	06/21/2023 1741
6:2 FTS	ND		1	8.0	2.0	ng/L	06/21/2023 1741
4:2 FTS	ND		1	8.0	0.87	ng/L	06/21/2023 1741
GenX	ND		1	8.0	2.1	ng/L	06/21/2023 1741
ADONA	ND		1	8.0	0.48	ng/L	06/21/2023 1741
EtFOSAA	ND		1	8.0	0.75	ng/L	06/21/2023 1741
MeFOSAA	ND		1	8.0	0.93	ng/L	06/21/2023 1741
PFBS	ND		1	4.0	0.41	ng/L	06/21/2023 1741
PFDS	ND		1	4.0	0.78	ng/L	06/21/2023 1741
PFHpS	ND		1	4.0	0.50	ng/L	06/21/2023 1741
PFNS	ND		1	4.0	0.71	ng/L	06/21/2023 1741
PFOSA	ND		1	4.0	0.61	ng/L	06/21/2023 1741
PFPeS	ND		1	4.0	0.59	ng/L	06/21/2023 1741
PFHxS	ND		1	4.0	0.55	ng/L	06/21/2023 1741
PFBA	ND		1	4.0	0.60	ng/L	06/21/2023 1741
PFDA	ND		1	4.0	0.52	ng/L	06/21/2023 1741
PFDoA	ND		1	4.0	0.47	ng/L	06/21/2023 1741
PFHpA	ND		1	4.0	0.45	ng/L	06/21/2023 1741
PFHxA	ND		1	4.0	0.69	ng/L	06/21/2023 1741
PFNA	ND		1	4.0	0.46	ng/L	06/21/2023 1741
PFOA	ND		1	4.0	0.83	ng/L	06/21/2023 1741
PFPeA	ND		1	4.0	0.54	ng/L	06/21/2023 1741
PFTeDA	ND		1	4.0	0.60	ng/L	06/21/2023 1741
PFTrDA	ND		1	4.0	0.53	ng/L	06/21/2023 1741
PFUdA	ND		1	4.0	0.63	ng/L	06/21/2023 1741
PFOS	ND		1	4.0	2.0	ng/L	06/21/2023 1741

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		116	25-150
13C2_6:2FTS		140	25-150
13C2_8:2FTS	N	206	25-150
13C2_PFDoA		108	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		107	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77582-001
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		109	25-150
13C7_PFUdA		102	25-150
13C8_PFOA		102	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		111	25-150
d5-EtFOSAA		110	25-150
d3-MeFOSAA		126	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77582-002
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	110	50-150	06/21/2023 1754
11Cl-PF3OUdS	15	16		1	109	50-150	06/21/2023 1754
8:2 FTS	15	16		1	103	50-150	06/21/2023 1754
6:2 FTS	15	16		1	106	50-150	06/21/2023 1754
4:2 FTS	15	16		1	107	50-150	06/21/2023 1754
GenX	32	34		1	108	50-150	06/21/2023 1754
ADONA	15	16		1	109	50-150	06/21/2023 1754
EtFOSAA	16	17		1	109	50-150	06/21/2023 1754
MeFOSAA	16	17		1	106	50-150	06/21/2023 1754
PFBS	14	15		1	106	50-150	06/21/2023 1754
PFDS	15	16		1	107	50-150	06/21/2023 1754
PFHpS	15	16		1	106	50-150	06/21/2023 1754
PFNS	15	16		1	104	50-150	06/21/2023 1754
PFOSA	16	17		1	107	50-150	06/21/2023 1754
PFPeS	15	15		1	103	50-150	06/21/2023 1754
PFHxS	15	15		1	103	50-150	06/21/2023 1754
PFBA	16	17		1	107	50-150	06/21/2023 1754
PFDA	16	18		1	110	50-150	06/21/2023 1754
PFDoA	16	18		1	112	50-150	06/21/2023 1754
PFHpA	16	17		1	108	50-150	06/21/2023 1754
PFHxA	16	18		1	111	50-150	06/21/2023 1754
PFNA	16	17		1	107	50-150	06/21/2023 1754
PFOA	16	18		1	109	50-150	06/21/2023 1754
PFPeA	16	17		1	105	50-150	06/21/2023 1754
PFTeDA	16	17		1	106	50-150	06/21/2023 1754
PFTrDA	16	18		1	112	50-150	06/21/2023 1754
PFUdA	16	17		1	104	50-150	06/21/2023 1754
PFOS	15	16		1	106	50-150	06/21/2023 1754

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		112	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		120	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		100	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		101	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77582-002
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		99	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		107	25-150
d3-MeFOSAA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YE26004-005MS
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	102	50-150	06/21/2023 1911
11Cl-PF3OUdS	ND	14	14		1	99	50-150	06/21/2023 1911
8:2 FTS	ND	14	15		1	105	50-150	06/21/2023 1911
6:2 FTS	ND	14	14		1	101	50-150	06/21/2023 1911
4:2 FTS	ND	14	14		1	100	50-150	06/21/2023 1911
GenX	ND	30	30		1	101	50-150	06/21/2023 1911
ADONA	ND	14	15		1	107	50-150	06/21/2023 1911
EtFOSAA	ND	15	16		1	110	50-150	06/21/2023 1911
MeFOSAA	ND	15	15		1	103	50-150	06/21/2023 1911
PFBS	1.3	13	15		1	102	50-150	06/21/2023 1911
PFDS	ND	14	13		1	92	50-150	06/21/2023 1911
PFHpS	ND	14	14		1	102	50-150	06/21/2023 1911
PFNS	ND	14	14		1	97	50-150	06/21/2023 1911
PFOSA	ND	15	16		1	105	50-150	06/21/2023 1911
PFPeS	ND	14	16		1	112	50-150	06/21/2023 1911
PFHxS	1.3	13	16		1	110	50-150	06/21/2023 1911
PFBA	3.0	15	18		1	104	50-150	06/21/2023 1911
PFDA	ND	15	15		1	103	50-150	06/21/2023 1911
PFDoA	ND	15	17		1	112	50-150	06/21/2023 1911
PFHpA	0.83	15	16		1	103	50-150	06/21/2023 1911
PFHxA	1.9	15	17		1	104	50-150	06/21/2023 1911
PFNA	ND	15	16		1	106	50-150	06/21/2023 1911
PFOA	5.0	15	21		1	105	50-150	06/21/2023 1911
PFPeA	1.3	15	16		1	97	50-150	06/21/2023 1911
PFTeDA	ND	15	16		1	106	50-150	06/21/2023 1911
PFTrDA	ND	15	14		1	98	50-150	06/21/2023 1911
PFUdA	ND	15	16		1	107	50-150	06/21/2023 1911
PFOS	ND	14	13		1	97	50-150	06/21/2023 1911

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	206	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		33	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YE26004-005MS
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		96	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		99	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		104	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YE26004-005MD
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	102	0.69	50-150	30	06/21/2023 1923
11Cl-PF3OUdS	ND	14	12		1	88	12	50-150	30	06/21/2023 1923
8:2 FTS	ND	14	15		1	107	2.1	50-150	30	06/21/2023 1923
6:2 FTS	ND	14	15		1	107	6.1	50-150	30	06/21/2023 1923
4:2 FTS	ND	14	13		1	96	3.7	50-150	30	06/21/2023 1923
GenX	ND	30	30		1	103	1.5	50-150	30	06/21/2023 1923
ADONA	ND	14	14		1	103	3.6	50-150	30	06/21/2023 1923
EtFOSAA	ND	15	15		1	102	7.7	50-150	30	06/21/2023 1923
MeFOSAA	ND	15	15		1	102	1.3	50-150	30	06/21/2023 1923
PFBS	1.3	13	14		1	101	0.33	50-150	30	06/21/2023 1923
PFDS	ND	14	12		1	85	8.0	50-150	30	06/21/2023 1923
PFHpS	ND	14	14		1	98	3.7	50-150	30	06/21/2023 1923
PFNS	ND	14	13		1	95	2.9	50-150	30	06/21/2023 1923
PFOSA	ND	15	15		1	102	3.0	50-150	30	06/21/2023 1923
PFPeS	ND	14	15		1	110	1.8	50-150	30	06/21/2023 1923
PFHxS	1.3	13	15		1	100	8.8	50-150	30	06/21/2023 1923
PFBA	3.0	15	18		1	100	3.0	50-150	30	06/21/2023 1923
PFDA	ND	15	16		1	105	1.7	50-150	30	06/21/2023 1923
PFDoA	ND	15	15		1	103	8.7	50-150	30	06/21/2023 1923
PFHpA	0.83	15	16		1	100	3.3	50-150	30	06/21/2023 1923
PFHxA	1.9	15	17		1	101	3.2	50-150	30	06/21/2023 1923
PFNA	ND	15	16		1	105	0.66	50-150	30	06/21/2023 1923
PFOA	5.0	15	19		1	94	8.9	50-150	30	06/21/2023 1923
PFPeA	1.3	15	16		1	99	1.8	50-150	30	06/21/2023 1923
PFTeDA	ND	15	15		1	101	4.9	50-150	30	06/21/2023 1923
PFTrDA	ND	15	15		1	103	5.5	50-150	30	06/21/2023 1923
PFUdA	ND	15	17		1	113	4.7	50-150	30	06/21/2023 1923
PFOS	ND	14	15		1	108	11	50-150	30	06/21/2023 1923

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	207	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		96	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		33	25-150
13C4_PFHpA		102	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		82	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YE26004-005MD
Batch: 77582
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1002

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		97	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77596-001
Batch: 77596
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/16/2023 1825
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/16/2023 1825
8:2 FTS	ND		1	8.0	1.6	ng/L	06/16/2023 1825
6:2 FTS	ND		1	8.0	2.0	ng/L	06/16/2023 1825
4:2 FTS	ND		1	8.0	0.87	ng/L	06/16/2023 1825
GenX	ND		1	8.0	2.1	ng/L	06/16/2023 1825
ADONA	ND		1	8.0	0.48	ng/L	06/16/2023 1825
EtFOSAA	ND		1	8.0	0.75	ng/L	06/16/2023 1825
MeFOSAA	ND		1	8.0	0.93	ng/L	06/16/2023 1825
PFBS	ND		1	4.0	0.41	ng/L	06/16/2023 1825
PFDS	ND		1	4.0	0.78	ng/L	06/16/2023 1825
PFHpS	ND		1	4.0	0.50	ng/L	06/16/2023 1825
PFNS	ND		1	4.0	0.71	ng/L	06/16/2023 1825
PFOSA	ND		1	4.0	0.61	ng/L	06/16/2023 1825
PFPeS	ND		1	4.0	0.59	ng/L	06/16/2023 1825
PFHxS	ND		1	4.0	0.55	ng/L	06/16/2023 1825
PFBA	ND		1	4.0	0.60	ng/L	06/16/2023 1825
PFDA	ND		1	4.0	0.52	ng/L	06/16/2023 1825
PFDoA	ND		1	4.0	0.47	ng/L	06/16/2023 1825
PFHpA	ND		1	4.0	0.45	ng/L	06/16/2023 1825
PFHxA	ND		1	4.0	0.69	ng/L	06/16/2023 1825
PFNA	ND		1	4.0	0.46	ng/L	06/16/2023 1825
PFOA	ND		1	4.0	0.83	ng/L	06/16/2023 1825
PFPeA	ND		1	4.0	0.54	ng/L	06/16/2023 1825
PFTeDA	ND		1	4.0	0.60	ng/L	06/16/2023 1825
PFTrDA	ND		1	4.0	0.53	ng/L	06/16/2023 1825
PFUdA	ND		1	4.0	0.63	ng/L	06/16/2023 1825
PFOS	ND		1	4.0	2.0	ng/L	06/16/2023 1825

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		104	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		106	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77596-001
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		104	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		102	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		103	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77596-002
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	06/16/2023 1838
11Cl-PF3OUdS	15	14		1	91	50-150	06/16/2023 1838
8:2 FTS	15	14		1	89	50-150	06/16/2023 1838
6:2 FTS	15	14		1	94	50-150	06/16/2023 1838
4:2 FTS	15	16		1	108	50-150	06/16/2023 1838
GenX	32	33		1	102	50-150	06/16/2023 1838
ADONA	15	15		1	103	50-150	06/16/2023 1838
EtFOSAA	16	16		1	100	50-150	06/16/2023 1838
MeFOSAA	16	17		1	108	50-150	06/16/2023 1838
PFBS	14	14		1	98	50-150	06/16/2023 1838
PFDS	15	14		1	88	50-150	06/16/2023 1838
PFHpS	15	16		1	102	50-150	06/16/2023 1838
PFNS	15	15		1	96	50-150	06/16/2023 1838
PFOSA	16	16		1	102	50-150	06/16/2023 1838
PFPeS	15	14		1	96	50-150	06/16/2023 1838
PFHxS	15	16		1	107	50-150	06/16/2023 1838
PFBA	16	17		1	103	50-150	06/16/2023 1838
PFDA	16	16		1	102	50-150	06/16/2023 1838
PFDoA	16	17		1	104	50-150	06/16/2023 1838
PFHpA	16	17		1	106	50-150	06/16/2023 1838
PFHxA	16	17		1	103	50-150	06/16/2023 1838
PFNA	16	15		1	96	50-150	06/16/2023 1838
PFOA	16	17		1	106	50-150	06/16/2023 1838
PFPeA	16	16		1	102	50-150	06/16/2023 1838
PFTeDA	16	18		1	111	50-150	06/16/2023 1838
PFTrDA	16	16		1	103	50-150	06/16/2023 1838
PFUdA	16	17		1	106	50-150	06/16/2023 1838
PFOS	15	15		1	102	50-150	06/16/2023 1838

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		106	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77596-002
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		102	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		102	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ77596-003
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	8.4	50-150	30	06/16/2023 1851
11Cl-PF3OUdS	15	15		1	96	5.6	50-150	30	06/16/2023 1851
8:2 FTS	15	15		1	101	13	50-150	30	06/16/2023 1851
6:2 FTS	15	14		1	94	0.25	50-150	30	06/16/2023 1851
4:2 FTS	15	15		1	99	8.3	50-150	30	06/16/2023 1851
GenX	32	31		1	98	4.2	50-150	30	06/16/2023 1851
ADONA	15	16		1	103	0.80	50-150	30	06/16/2023 1851
EtFOSAA	16	16		1	99	1.0	50-150	30	06/16/2023 1851
MeFOSAA	16	16		1	101	6.1	50-150	30	06/16/2023 1851
PFBS	14	13		1	93	4.8	50-150	30	06/16/2023 1851
PFDS	15	14		1	89	1.4	50-150	30	06/16/2023 1851
PFHpS	15	16		1	102	0.16	50-150	30	06/16/2023 1851
PFNS	15	15		1	97	1.2	50-150	30	06/16/2023 1851
PFOSA	16	15		1	95	7.1	50-150	30	06/16/2023 1851
PFPeS	15	14		1	92	4.3	50-150	30	06/16/2023 1851
PFHxS	15	15		1	105	2.1	50-150	30	06/16/2023 1851
PFBA	16	16		1	99	4.3	50-150	30	06/16/2023 1851
PFDA	16	16		1	103	0.74	50-150	30	06/16/2023 1851
PFDoA	16	16		1	98	5.2	50-150	30	06/16/2023 1851
PFHpA	16	16		1	102	3.2	50-150	30	06/16/2023 1851
PFHxA	16	16		1	99	4.0	50-150	30	06/16/2023 1851
PFNA	16	15		1	97	0.34	50-150	30	06/16/2023 1851
PFOA	16	16		1	98	7.3	50-150	30	06/16/2023 1851
PFPeA	16	16		1	97	5.1	50-150	30	06/16/2023 1851
PFTeDA	16	17		1	108	2.3	50-150	30	06/16/2023 1851
PFTrDA	16	16		1	99	3.6	50-150	30	06/16/2023 1851
PFUdA	16	16		1	97	8.6	50-150	30	06/16/2023 1851
PFOS	15	15		1	102	0.65	50-150	30	06/16/2023 1851

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		108	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		112	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		110	25-150
13C4_PFBA		113	25-150
13C4_PFHpA		113	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		111	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ77596-003
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		107	25-150
13C7_PFUdA		113	25-150
13C8_PFOA		111	25-150
13C8_PFOS		108	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		113	25-150
d3-MeFOSAA		114	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical®
Plant 3

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 141874

Client: Arcadis	Report to Contact: Tiffany Linder/Kathryn Hurd	Telephone No. / E-mail: kathryn.hurd@arcadis.com	Quote No:
Address: 28550 Cabot Dr Ste 500	Sampler's Signature: x Alyssa Mandich	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Novi / State: MI / Zip Code: 48377	Printed Name: Alyssa Mandich		Lot # Bar Code (lab use only): YE26004
Project Name: RACER Lansing SNS			
Project No: 30171056.0370 A	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HSO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS 537.1 w/ EPA 533	Lot # Bar Code (lab use only)
MW-18-100_052323	5/23/23	1005	G	X			2							2	
MW-18-99_052323	5/23/23	1230	G	X			2							2	
MW-19-98_052323	5/23/23	1350	G	X			2							2	
MW-18-101_052323	5/23/23	1345	G	X			2							2	
MW-19-111_052423	5/24/23	1420	G	X			6							6	MS/MSD
MW-18_88_052423	5/24/23	1435	G	X			2							2	
MW-19-108_052423	5/24/23	1530	G	X			2							2	
LINK-15_052423	5/24/23	1555	G	X			2							2	
MW-18-95_052423	5/24/23	1655	G	X			2							2	
DUP-04_052323	5/23/23	—	G	X			2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT.): [X] Standard [ ] Rush (Specify)

Sample Disposal: [ ] Return to Client [X] Disposal by Lab

Possible Hazard Identification: [ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison [ ] Unknown

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished by: Alyssa Mandich / Arcadis	5/25/23	1940	1. Received by: FedEX	5/25/23	0940
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	5/26/23	0905	4. Laboratory received by: [signature]	5/26/23	0905

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No — Ice Pack — Receipt Temp 2.4 °C — Temp Blank: [ ] Y [X] N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MCC03N2-01

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Plant 3

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Number 141878

Client: Arcadis	Report to Contact: Tiffany Lindsey, Kathyn Hunt	Telephone No. / E-mail: Kathyn.hunt@arcadis.com
Address: 28550 Cabot Dr. Ste 500	Sampler's Signature: x Amyssa Mandich	Analysis (Attach list if more space is needed)
City: Novi / State: MI / Zip Code: 48377	Printed Name: Amyssa Mandich	Quote No.
Project Name: RACER-Lansing GWS		Page 2 of 2
Project No.: 30171056.0370A	P.O. No.	Lot # Bar Code (lab use only): YE26004

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Wipe/Oil	No. of Containers by Preservative Type: Ethanol	HCl	H2SO4	HNO3	NaOH	Na2S2O3	Field Filtered	537 MOD EPA 537 MOD EPA 8260
MW-19-10T_052423	5/24/23	1635	G	X										2 2
MW-18-10S_052423	5/24/23	1735	G	X										2 2

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)	Sample Disposal: ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)			
1. Relinquished by: Amyssa Mandich / Arcadis	Date: 5/25/23	Time: 0940	1. Received by: FedEx	Date: 5/25/23	Time: 0940	
2. Relinquished by	Date	Time	2. Received by	Date	Time	
3. Relinquished by	Date	Time	3. Received by	Date	Time	
4. Relinquished by: FedEx	Date: 5/26/23	Time: 0905	4. Laboratory received by	Date: 5/26/23	Time: 0905	
Note: All samples are retained for four weeks from receipt unless other arrangements are made.			LAB USE ONLY Received on Ice (Circle) (Yes) No Ice Pack	Receipt Temp: 2.4 °C	Temp Blank: ☐ Y ☒N	

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: CDR / 5/26/23 Lot #: YE26004

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA
2.4 / 2.4 °C NA / NA °C NA / NA °C NA / NA °C
Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YE30011**

Date Completed:06/23/2023

06/23/2023 1:04 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YE30011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18, PFAS by Isotope Dilution SOP.

Pace is a DoD/DoE and TNI accredited laboratory; however, Pace is not accredited for PFAS Direct Aqueous Injection or Method D8421.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Sample YE30011-004 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YE30011-001, YE30011-002, YE30011-004, YE30011-005, YE30011-006, YE30011-007, YE30011-009, YE30011-010, YE30011-011, YE30011-012, YE30011-013. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside of acceptance limits: YE30011-014. There was insufficient sample to perform a re-extraction; therefore, the data have been reported.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YE30011

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-20-131_052323	Aqueous	05/23/2023 1535	05/30/2023
002	MW-20-132_052323	Aqueous	05/23/2023 1710	05/30/2023
003	MW-22-152_052323	Aqueous	05/23/2023 1640	05/30/2023
004	MW-22-151_052323	Aqueous	05/23/2023 1810	05/30/2023
005	MW-21-135_052423	Aqueous	05/24/2023 0850	05/30/2023
006	MW-21-134_052423	Aqueous	05/24/2023 1005	05/30/2023
007	MW-21-133_052423	Aqueous	05/24/2023 1125	05/30/2023
008	MW-22-148_052423	Aqueous	05/24/2023 0845	05/30/2023
009	DUP-08_052323	Aqueous	05/23/2023	05/30/2023
010	DUP-07_052323	Aqueous	05/23/2023	05/30/2023
011	MW-22-150_052423	Aqueous	05/24/2023 1005	05/30/2023
012	MW-12-12_052423	Aqueous	05/24/2023 1120	05/30/2023
013	MW-12-13_052423	Aqueous	05/24/2023 1245	05/30/2023
014	MW-13-36R_052423	Aqueous	05/24/2023 1235	05/30/2023

(14 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YE30011

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-20-131_052323	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	9
001	MW-20-131_052323	Aqueous	PFHxS	PFAS by ID	1.7	J	ng/L	9
001	MW-20-131_052323	Aqueous	PFBA	PFAS by ID	25		ng/L	9
001	MW-20-131_052323	Aqueous	PFHpA	PFAS by ID	21		ng/L	9
001	MW-20-131_052323	Aqueous	PFHxA	PFAS by ID	24		ng/L	9
001	MW-20-131_052323	Aqueous	PFNA	PFAS by ID	1.3	J	ng/L	9
001	MW-20-131_052323	Aqueous	PFOA	PFAS by ID	32		ng/L	9
001	MW-20-131_052323	Aqueous	PFPeA	PFAS by ID	29		ng/L	9
001	MW-20-131_052323	Aqueous	PFOS	PFAS by ID	3.3	J	ng/L	9
002	MW-20-132_052323	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	11
002	MW-20-132_052323	Aqueous	PFHxS	PFAS by ID	0.82	J	ng/L	11
002	MW-20-132_052323	Aqueous	PFBA	PFAS by ID	8.9		ng/L	11
002	MW-20-132_052323	Aqueous	PFDA	PFAS by ID	1.1	J	ng/L	11
002	MW-20-132_052323	Aqueous	PFHpA	PFAS by ID	7.7		ng/L	11
002	MW-20-132_052323	Aqueous	PFHxA	PFAS by ID	8.0		ng/L	11
002	MW-20-132_052323	Aqueous	PFNA	PFAS by ID	2.1	J	ng/L	11
002	MW-20-132_052323	Aqueous	PFOA	PFAS by ID	13		ng/L	11
002	MW-20-132_052323	Aqueous	PFPeA	PFAS by ID	8.7		ng/L	11
002	MW-20-132_052323	Aqueous	PFOS	PFAS by ID	6.9		ng/L	11
003	MW-22-152_052323	Aqueous	PFBS	PFAS by ID	6.0		ng/L	13
003	MW-22-152_052323	Aqueous	PFHxS	PFAS by ID	4.0		ng/L	13
003	MW-22-152_052323	Aqueous	PFBA	PFAS by ID	5.1		ng/L	13
003	MW-22-152_052323	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	13
003	MW-22-152_052323	Aqueous	PFHxA	PFAS by ID	2.9	J	ng/L	13
003	MW-22-152_052323	Aqueous	PFOA	PFAS by ID	4.0		ng/L	13
003	MW-22-152_052323	Aqueous	PFPeA	PFAS by ID	3.8		ng/L	13
004	MW-22-151_052323	Aqueous	ADONA	PFAS by ID	0.94	J	ng/L	15
004	MW-22-151_052323	Aqueous	PFBS	PFAS by ID	7.9		ng/L	15
004	MW-22-151_052323	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	15
004	MW-22-151_052323	Aqueous	PFBA	PFAS by ID	11		ng/L	15
004	MW-22-151_052323	Aqueous	PFHpA	PFAS by ID	3.1	J	ng/L	15
004	MW-22-151_052323	Aqueous	PFHxA	PFAS by ID	6.7		ng/L	15
004	MW-22-151_052323	Aqueous	PFNA	PFAS by ID	0.54	J	ng/L	15
004	MW-22-151_052323	Aqueous	PFOA	PFAS by ID	8.6		ng/L	15
004	MW-22-151_052323	Aqueous	PFPeA	PFAS by ID	12		ng/L	15
004	MW-22-151_052323	Aqueous	PFOS	PFAS by ID	4.0		ng/L	15
005	MW-21-135_052423	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	17
005	MW-21-135_052423	Aqueous	PFPeS	PFAS by ID	1.0	J	ng/L	17
005	MW-21-135_052423	Aqueous	PFHxS	PFAS by ID	2.3	J	ng/L	17
005	MW-21-135_052423	Aqueous	PFBA	PFAS by ID	10		ng/L	17
005	MW-21-135_052423	Aqueous	PFHpA	PFAS by ID	44		ng/L	17
005	MW-21-135_052423	Aqueous	PFHxA	PFAS by ID	30		ng/L	17
005	MW-21-135_052423	Aqueous	PFNA	PFAS by ID	1.4	J	ng/L	17

Detection Summary (Continued)

Lot Number: YE30011

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	MW-21-135_052423	Aqueous	PFOA	PFAS by ID	47		ng/L	17
005	MW-21-135_052423	Aqueous	PFPeA	PFAS by ID	23		ng/L	17
006	MW-21-134_052423	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	19
006	MW-21-134_052423	Aqueous	PFHpS	PFAS by ID	1.2	J	ng/L	19
006	MW-21-134_052423	Aqueous	PFPeS	PFAS by ID	0.57	J	ng/L	19
006	MW-21-134_052423	Aqueous	PFHxS	PFAS by ID	1.9	J	ng/L	19
006	MW-21-134_052423	Aqueous	PFBA	PFAS by ID	10		ng/L	19
006	MW-21-134_052423	Aqueous	PFHpA	PFAS by ID	17		ng/L	19
006	MW-21-134_052423	Aqueous	PFHxA	PFAS by ID	21		ng/L	19
006	MW-21-134_052423	Aqueous	PFNA	PFAS by ID	0.55	J	ng/L	19
006	MW-21-134_052423	Aqueous	PFOA	PFAS by ID	29		ng/L	19
006	MW-21-134_052423	Aqueous	PFPeA	PFAS by ID	18		ng/L	19
006	MW-21-134_052423	Aqueous	PFOS	PFAS by ID	4.2		ng/L	19
007	MW-21-133_052423	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	21
007	MW-21-133_052423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	21
007	MW-21-133_052423	Aqueous	PFBA	PFAS by ID	5.1		ng/L	21
007	MW-21-133_052423	Aqueous	PFHpA	PFAS by ID	5.5		ng/L	21
007	MW-21-133_052423	Aqueous	PFHxA	PFAS by ID	6.5		ng/L	21
007	MW-21-133_052423	Aqueous	PFNA	PFAS by ID	0.60	J	ng/L	21
007	MW-21-133_052423	Aqueous	PFOA	PFAS by ID	16		ng/L	21
007	MW-21-133_052423	Aqueous	PFPeA	PFAS by ID	4.3		ng/L	21
007	MW-21-133_052423	Aqueous	PFOS	PFAS by ID	4.3		ng/L	21
008	MW-22-148_052423	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	23
008	MW-22-148_052423	Aqueous	PFOSA	PFAS by ID	0.65	J	ng/L	23
009	DUP-08_052323	Aqueous	PFBS	PFAS by ID	6.2		ng/L	25
009	DUP-08_052323	Aqueous	PFHxS	PFAS by ID	3.9		ng/L	25
009	DUP-08_052323	Aqueous	PFBA	PFAS by ID	5.1		ng/L	25
009	DUP-08_052323	Aqueous	PFHpA	PFAS by ID	1.4	J	ng/L	25
009	DUP-08_052323	Aqueous	PFHxA	PFAS by ID	3.1	J	ng/L	25
009	DUP-08_052323	Aqueous	PFOA	PFAS by ID	4.0		ng/L	25
009	DUP-08_052323	Aqueous	PFPeA	PFAS by ID	3.9		ng/L	25
010	DUP-07_052323	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	27
010	DUP-07_052323	Aqueous	PFHxS	PFAS by ID	0.86	J	ng/L	27
010	DUP-07_052323	Aqueous	PFBA	PFAS by ID	8.9		ng/L	27
010	DUP-07_052323	Aqueous	PFDA	PFAS by ID	0.91	J	ng/L	27
010	DUP-07_052323	Aqueous	PFHpA	PFAS by ID	7.4		ng/L	27
010	DUP-07_052323	Aqueous	PFHxA	PFAS by ID	8.4		ng/L	27
010	DUP-07_052323	Aqueous	PFNA	PFAS by ID	2.5	J	ng/L	27
010	DUP-07_052323	Aqueous	PFOA	PFAS by ID	14		ng/L	27
010	DUP-07_052323	Aqueous	PFPeA	PFAS by ID	8.8		ng/L	27
010	DUP-07_052323	Aqueous	PFOS	PFAS by ID	6.9		ng/L	27
011	MW-22-150_052423	Aqueous	PFBA	PFAS by ID	2.7	J	ng/L	29
011	MW-22-150_052423	Aqueous	PFPeA	PFAS by ID	1.3	J	ng/L	29
012	MW-12-12_052423	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	31
012	MW-12-12_052423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	31
012	MW-12-12_052423	Aqueous	PFBA	PFAS by ID	43		ng/L	31
012	MW-12-12_052423	Aqueous	PFDA	PFAS by ID	8.5		ng/L	31
012	MW-12-12_052423	Aqueous	PFHpA	PFAS by ID	34		ng/L	31

Detection Summary (Continued)

Lot Number: YE30011

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
012	MW-12-12_052423	Aqueous	PFHxA	PFAS by ID	110		ng/L	31
012	MW-12-12_052423	Aqueous	PFNA	PFAS by ID	3.6	J	ng/L	31
012	MW-12-12_052423	Aqueous	PFOA	PFAS by ID	74		ng/L	31
012	MW-12-12_052423	Aqueous	PFPeA	PFAS by ID	62		ng/L	31
012	MW-12-12_052423	Aqueous	PFOS	PFAS by ID	22		ng/L	31
013	MW-12-13_052423	Aqueous	PFBS	PFAS by ID	3.0	J	ng/L	33
013	MW-12-13_052423	Aqueous	PFBA	PFAS by ID	30		ng/L	33
013	MW-12-13_052423	Aqueous	PFHpA	PFAS by ID	21		ng/L	33
013	MW-12-13_052423	Aqueous	PFHxA	PFAS by ID	59		ng/L	33
013	MW-12-13_052423	Aqueous	PFOA	PFAS by ID	5.0		ng/L	33
013	MW-12-13_052423	Aqueous	PFPeA	PFAS by ID	36		ng/L	33
014	MW-13-36R_052423	Aqueous	EtFOSAA	PFAS by ID	5.4	J	ng/L	35
014	MW-13-36R_052423	Aqueous	MeFOSAA	PFAS by ID	3.4	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFOSA	PFAS by ID	3.0	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFHxS	PFAS by ID	1.9	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFBA	PFAS by ID	34	Q	ng/L	35
014	MW-13-36R_052423	Aqueous	PFDA	PFAS by ID	20		ng/L	35
014	MW-13-36R_052423	Aqueous	PFDoA	PFAS by ID	0.52	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFHpA	PFAS by ID	32		ng/L	35
014	MW-13-36R_052423	Aqueous	PFHxA	PFAS by ID	33		ng/L	35
014	MW-13-36R_052423	Aqueous	PFNA	PFAS by ID	12		ng/L	35
014	MW-13-36R_052423	Aqueous	PFOA	PFAS by ID	63		ng/L	35
014	MW-13-36R_052423	Aqueous	PFPeA	PFAS by ID	31	Q	ng/L	35
014	MW-13-36R_052423	Aqueous	PFUdA	PFAS by ID	0.72	J	ng/L	35
014	MW-13-36R_052423	Aqueous	PFOS	PFAS by ID	37		ng/L	35

(117 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-001**

Description: **MW-20-131_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1535** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 1942	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**25**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**21**		**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**32**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**29**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	279	25-150
13C2_6:2FTS	N	209	25-150
13C2_8:2FTS		121	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		113	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		46	25-150
13C4_PFHpA		115	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YE30011-001**
Description: **MW-20-131_052323**
Matrix: **Aqueous**
Date Sampled: **05/23/2023 1535**
Project Name: **RACER Lansing GWS**
Date Received: **05/30/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-002**

Description: **MW-20-132_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1710** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 1954	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.82**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.1**	**J**	**3.6**	**0.47**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.7**		**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.0**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.1**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**13**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.7**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**6.9**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	200	25-150
13C2_6:2FTS		130	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		110	25-150
13C3-HFPO-DA		102	25-150
13C4_PFBA		61	25-150
13C4_PFHpA		111	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-002**

Description: **MW-20-132_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1710** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-003**

Description: **MW-22-152_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1640** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 2007	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**6.0**		**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.0**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.1**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.6**	**J**	**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.9**	**J**	**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.0**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.8**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		104	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		103	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-003**

Description: **MW-22-152_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1640** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-004**

Description: **MW-22-151_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1810** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 2020	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	**919005-14-4**	**PFAS by ID SOP**	**0.94**	**J**	**7.5**	**0.45**	**ng/L**	**1**
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**7.9**		**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.67	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.7**	**0.52**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.1**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.7**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.54**	**J**	**3.7**	**0.43**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.6**		**3.7**	**0.78**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.59	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.0**		**3.7**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	255	25-150
13C2_6:2FTS	N	192	25-150
13C2_8:2FTS		121	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		79	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		98	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-004**

Description: **MW-22-151_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023 1810** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-005**

Description: **MW-21-135_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 0850** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/16/2023 2032	ARC2	06/14/2023 1755	77596

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.0**	**J**	**3.7**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.3**	**J**	**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**44**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**30**		**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.4**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**47**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**23**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	182	25-150
13C2_6:2FTS		135	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		107	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		111	25-150
13C5_PFHxA		110	25-150
13C5_PFPeA		99	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YE30011-005**
Description: **MW-21-135_052423**
Matrix: **Aqueous**
Date Sampled: **05/24/2023 0850**
Project Name: **RACER Lansing GWS**
Date Received: **05/30/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		109	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-006**

Description: **MW-21-134_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2106	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.2**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.57**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**21**		**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.55**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**		**3.6**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.2**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	173	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		106	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		102	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		94	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-006**

Description: **MW-21-134_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-007**

Description: **MW-21-133_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1125** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2119	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.1**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.5**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.5**		**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.60**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.3**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.3**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	209	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		50	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-007**

Description: **MW-21-133_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1125** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-008**

Description: **MW-22-148_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 0845** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2131	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.65**	**J**	**3.7**	**0.57**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		69	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-008**

Description: **MW-22-148_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 0845** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-009**

Description: **DUP-08_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2235	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**6.2**		**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.9**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.1**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.4**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.0**		**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.9**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	179	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		127	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		112	25-150
13C3-HFPO-DA		107	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		113	25-150
13C5_PFPeA		99	25-150
13C6_PFDA		106	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-009**

Description: **DUP-08_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-010**

Description: **DUP-07_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2248	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.86**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.91**	**J**	**3.7**	**0.48**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.4**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.4**		**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.5**	**J**	**3.7**	**0.43**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.8**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**6.9**		**3.7**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	300	25-150
13C2_6:2FTS	N	169	25-150
13C2_8:2FTS		119	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		36	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-010**

Description: **DUP-07_052323** Matrix: **Aqueous**

Date Sampled: **05/23/2023** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-011**

Description: **MW-22-150_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2301	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	326	25-150
13C2_6:2FTS		137	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		28	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		65	25-150
13C6_PFDA		90	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-011**

Description: **MW-22-150_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-012**

Description: **MW-12-12_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1120** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2314	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.67	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.52**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**43**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**8.5**		**3.7**	**0.49**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**34**		**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**110**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.6**	**J**	**3.7**	**0.43**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**74**		**3.7**	**0.78**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**62**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.59	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**22**		**3.7**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	340	25-150
13C2_6:2FTS	N	217	25-150
13C2_8:2FTS	N	155	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		34	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		68	25-150
13C6_PFDA		91	25-150
13C7_PFUdA		94	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-012**

Description: **MW-12-12_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1120** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-013**

Description: **MW-12-13_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2327	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.0**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**30**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**21**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**59**		**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**36**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	230	25-150
13C2_6:2FTS		107	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		44	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-013**

Description: **MW-12-13_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-014**

Description: **MW-13-36R_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1235** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/21/2023 2339	ARC2	06/14/2023 1526	77628

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**5.4**	**J**	**7.4**	**0.70**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**3.4**	**J**	**7.4**	**0.86**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**3.0**	**J**	**3.7**	**0.57**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**34**	**Q**	**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**20**		**3.7**	**0.49**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.52**	**J**	**3.7**	**0.44**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**32**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**33**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**12**		**3.7**	**0.43**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**63**		**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**31**	**Q**	**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.72**	**J**	**3.7**	**0.58**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**37**		**3.7**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	386	25-150
13C2_6:2FTS	N	311	25-150
13C2_8:2FTS	N	273	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA	N	2.1	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA	N	12	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		101	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YE30011-014**

Description: **MW-13-36R_052423** Matrix: **Aqueous**

Date Sampled: **05/24/2023 1235** Project Name: **RACER Lansing GWS**

Date Received: **05/30/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		125	25-150
d3-MeFOSAA		127	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ77596-001
Batch: 77596
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/16/2023 1825
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/16/2023 1825
8:2 FTS	ND		1	8.0	1.6	ng/L	06/16/2023 1825
6:2 FTS	ND		1	8.0	2.0	ng/L	06/16/2023 1825
4:2 FTS	ND		1	8.0	0.87	ng/L	06/16/2023 1825
GenX	ND		1	8.0	2.1	ng/L	06/16/2023 1825
ADONA	ND		1	8.0	0.48	ng/L	06/16/2023 1825
EtFOSAA	ND		1	8.0	0.75	ng/L	06/16/2023 1825
MeFOSAA	ND		1	8.0	0.93	ng/L	06/16/2023 1825
PFBS	ND		1	4.0	0.41	ng/L	06/16/2023 1825
PFDS	ND		1	4.0	0.78	ng/L	06/16/2023 1825
PFHpS	ND		1	4.0	0.50	ng/L	06/16/2023 1825
PFNS	ND		1	4.0	0.71	ng/L	06/16/2023 1825
PFOSA	ND		1	4.0	0.61	ng/L	06/16/2023 1825
PFPeS	ND		1	4.0	0.59	ng/L	06/16/2023 1825
PFHxS	ND		1	4.0	0.55	ng/L	06/16/2023 1825
PFBA	ND		1	4.0	0.60	ng/L	06/16/2023 1825
PFDA	ND		1	4.0	0.52	ng/L	06/16/2023 1825
PFDoA	ND		1	4.0	0.47	ng/L	06/16/2023 1825
PFHpA	ND		1	4.0	0.45	ng/L	06/16/2023 1825
PFHxA	ND		1	4.0	0.69	ng/L	06/16/2023 1825
PFNA	ND		1	4.0	0.46	ng/L	06/16/2023 1825
PFOA	ND		1	4.0	0.83	ng/L	06/16/2023 1825
PFPeA	ND		1	4.0	0.54	ng/L	06/16/2023 1825
PFTeDA	ND		1	4.0	0.60	ng/L	06/16/2023 1825
PFTrDA	ND		1	4.0	0.53	ng/L	06/16/2023 1825
PFUdA	ND		1	4.0	0.63	ng/L	06/16/2023 1825
PFOS	ND		1	4.0	2.0	ng/L	06/16/2023 1825

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		104	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		96	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		106	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77596-001
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		104	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		102	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		103	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77596-002
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	105	50-150	06/16/2023 1838
11Cl-PF3OUdS	15	14		1	91	50-150	06/16/2023 1838
8:2 FTS	15	14		1	89	50-150	06/16/2023 1838
6:2 FTS	15	14		1	94	50-150	06/16/2023 1838
4:2 FTS	15	16		1	108	50-150	06/16/2023 1838
GenX	32	33		1	102	50-150	06/16/2023 1838
ADONA	15	15		1	103	50-150	06/16/2023 1838
EtFOSAA	16	16		1	100	50-150	06/16/2023 1838
MeFOSAA	16	17		1	108	50-150	06/16/2023 1838
PFBS	14	14		1	98	50-150	06/16/2023 1838
PFDS	15	14		1	88	50-150	06/16/2023 1838
PFHpS	15	16		1	102	50-150	06/16/2023 1838
PFNS	15	15		1	96	50-150	06/16/2023 1838
PFOSA	16	16		1	102	50-150	06/16/2023 1838
PFPeS	15	14		1	96	50-150	06/16/2023 1838
PFHxS	15	16		1	107	50-150	06/16/2023 1838
PFBA	16	17		1	103	50-150	06/16/2023 1838
PFDA	16	16		1	102	50-150	06/16/2023 1838
PFDoA	16	17		1	104	50-150	06/16/2023 1838
PFHpA	16	17		1	106	50-150	06/16/2023 1838
PFHxA	16	17		1	103	50-150	06/16/2023 1838
PFNA	16	15		1	96	50-150	06/16/2023 1838
PFOA	16	17		1	106	50-150	06/16/2023 1838
PFPeA	16	16		1	102	50-150	06/16/2023 1838
PFTeDA	16	18		1	111	50-150	06/16/2023 1838
PFTrDA	16	16		1	103	50-150	06/16/2023 1838
PFUdA	16	17		1	106	50-150	06/16/2023 1838
PFOS	15	15		1	102	50-150	06/16/2023 1838

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		106	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77596-002
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		102	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		102	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		108	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ77596-003
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	14		1	97	8.4	50-150	30	06/16/2023 1851
11Cl-PF3OUdS	15	15		1	96	5.6	50-150	30	06/16/2023 1851
8:2 FTS	15	15		1	101	13	50-150	30	06/16/2023 1851
6:2 FTS	15	14		1	94	0.25	50-150	30	06/16/2023 1851
4:2 FTS	15	15		1	99	8.3	50-150	30	06/16/2023 1851
GenX	32	31		1	98	4.2	50-150	30	06/16/2023 1851
ADONA	15	16		1	103	0.80	50-150	30	06/16/2023 1851
EtFOSAA	16	16		1	99	1.0	50-150	30	06/16/2023 1851
MeFOSAA	16	16		1	101	6.1	50-150	30	06/16/2023 1851
PFBS	14	13		1	93	4.8	50-150	30	06/16/2023 1851
PFDS	15	14		1	89	1.4	50-150	30	06/16/2023 1851
PFHpS	15	16		1	102	0.16	50-150	30	06/16/2023 1851
PFNS	15	15		1	97	1.2	50-150	30	06/16/2023 1851
PFOSA	16	15		1	95	7.1	50-150	30	06/16/2023 1851
PFPeS	15	14		1	92	4.3	50-150	30	06/16/2023 1851
PFHxS	15	15		1	105	2.1	50-150	30	06/16/2023 1851
PFBA	16	16		1	99	4.3	50-150	30	06/16/2023 1851
PFDA	16	16		1	103	0.74	50-150	30	06/16/2023 1851
PFDoA	16	16		1	98	5.2	50-150	30	06/16/2023 1851
PFHpA	16	16		1	102	3.2	50-150	30	06/16/2023 1851
PFHxA	16	16		1	99	4.0	50-150	30	06/16/2023 1851
PFNA	16	15		1	97	0.34	50-150	30	06/16/2023 1851
PFOA	16	16		1	98	7.3	50-150	30	06/16/2023 1851
PFPeA	16	16		1	97	5.1	50-150	30	06/16/2023 1851
PFTeDA	16	17		1	108	2.3	50-150	30	06/16/2023 1851
PFTrDA	16	16		1	99	3.6	50-150	30	06/16/2023 1851
PFUdA	16	16		1	97	8.6	50-150	30	06/16/2023 1851
PFOS	15	15		1	102	0.65	50-150	30	06/16/2023 1851

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		108	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		112	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		110	25-150
13C4_PFBA		113	25-150
13C4_PFHpA		113	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		111	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: YQ77596-003
Batch: 77596
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1755

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		107	25-150
13C7_PFUdA		113	25-150
13C8_PFOA		111	25-150
13C8_PFOS		108	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		113	25-150
d3-MeFOSAA		114	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77628-001
Batch: 77628
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/21/2023 2040
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/21/2023 2040
8:2 FTS	ND		1	8.0	1.6	ng/L	06/21/2023 2040
6:2 FTS	ND		1	8.0	2.0	ng/L	06/21/2023 2040
4:2 FTS	ND		1	8.0	0.87	ng/L	06/21/2023 2040
GenX	ND		1	8.0	2.1	ng/L	06/21/2023 2040
ADONA	ND		1	8.0	0.48	ng/L	06/21/2023 2040
EtFOSAA	ND		1	8.0	0.75	ng/L	06/21/2023 2040
MeFOSAA	ND		1	8.0	0.93	ng/L	06/21/2023 2040
PFBS	ND		1	4.0	0.41	ng/L	06/21/2023 2040
PFDS	ND		1	4.0	0.78	ng/L	06/21/2023 2040
PFHpS	ND		1	4.0	0.50	ng/L	06/21/2023 2040
PFNS	ND		1	4.0	0.71	ng/L	06/21/2023 2040
PFOSA	ND		1	4.0	0.61	ng/L	06/21/2023 2040
PFPeS	ND		1	4.0	0.59	ng/L	06/21/2023 2040
PFHxS	ND		1	4.0	0.55	ng/L	06/21/2023 2040
PFBA	ND		1	4.0	0.60	ng/L	06/21/2023 2040
PFDA	ND		1	4.0	0.52	ng/L	06/21/2023 2040
PFDoA	ND		1	4.0	0.47	ng/L	06/21/2023 2040
PFHpA	ND		1	4.0	0.45	ng/L	06/21/2023 2040
PFHxA	ND		1	4.0	0.69	ng/L	06/21/2023 2040
PFNA	ND		1	4.0	0.46	ng/L	06/21/2023 2040
PFOA	ND		1	4.0	0.83	ng/L	06/21/2023 2040
PFPeA	ND		1	4.0	0.54	ng/L	06/21/2023 2040
PFTeDA	ND		1	4.0	0.60	ng/L	06/21/2023 2040
PFTrDA	ND		1	4.0	0.53	ng/L	06/21/2023 2040
PFUdA	ND		1	4.0	0.63	ng/L	06/21/2023 2040
PFOS	ND		1	4.0	2.0	ng/L	06/21/2023 2040

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		106	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		101	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ77628-001
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		97	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77628-002
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	104	50-150	06/21/2023 2053
11Cl-PF3OUdS	15	15		1	101	50-150	06/21/2023 2053
8:2 FTS	15	17		1	109	50-150	06/21/2023 2053
6:2 FTS	15	15		1	99	50-150	06/21/2023 2053
4:2 FTS	15	16		1	108	50-150	06/21/2023 2053
GenX	32	33		1	105	50-150	06/21/2023 2053
ADONA	15	16		1	108	50-150	06/21/2023 2053
EtFOSAA	16	17		1	104	50-150	06/21/2023 2053
MeFOSAA	16	15		1	97	50-150	06/21/2023 2053
PFBS	14	15		1	105	50-150	06/21/2023 2053
PFDS	15	15		1	100	50-150	06/21/2023 2053
PFHpS	15	16		1	103	50-150	06/21/2023 2053
PFNS	15	16		1	103	50-150	06/21/2023 2053
PFOSA	16	17		1	108	50-150	06/21/2023 2053
PFPeS	15	16		1	105	50-150	06/21/2023 2053
PFHxS	15	15		1	103	50-150	06/21/2023 2053
PFBA	16	17		1	104	50-150	06/21/2023 2053
PFDA	16	18		1	110	50-150	06/21/2023 2053
PFDoA	16	17		1	107	50-150	06/21/2023 2053
PFHpA	16	17		1	104	50-150	06/21/2023 2053
PFHxA	16	17		1	106	50-150	06/21/2023 2053
PFNA	16	17		1	106	50-150	06/21/2023 2053
PFOA	16	17		1	106	50-150	06/21/2023 2053
PFPeA	16	17		1	107	50-150	06/21/2023 2053
PFTeDA	16	17		1	104	50-150	06/21/2023 2053
PFTrDA	16	17		1	106	50-150	06/21/2023 2053
PFUdA	16	16		1	101	50-150	06/21/2023 2053
PFOS	15	16		1	105	50-150	06/21/2023 2053

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		102	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		100	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ77628-002
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		96	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YE30011-008MS
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	98	50-150	06/21/2023 2144
11Cl-PF3OUdS	ND	14	13		1	95	50-150	06/21/2023 2144
8:2 FTS	ND	14	14		1	100	50-150	06/21/2023 2144
6:2 FTS	ND	14	15		1	106	50-150	06/21/2023 2144
4:2 FTS	ND	14	15		1	106	50-150	06/21/2023 2144
GenX	ND	30	32		1	107	50-150	06/21/2023 2144
ADONA	ND	14	14		1	101	50-150	06/21/2023 2144
EtFOSAA	ND	15	17		1	116	50-150	06/21/2023 2144
MeFOSAA	ND	15	16		1	108	50-150	06/21/2023 2144
PFBS	1.4	13	15		1	102	50-150	06/21/2023 2144
PFDS	ND	14	13		1	94	50-150	06/21/2023 2144
PFHpS	ND	14	14		1	99	50-150	06/21/2023 2144
PFNS	ND	14	14		1	97	50-150	06/21/2023 2144
PFOSA	0.65	15	17		1	107	50-150	06/21/2023 2144
PFPeS	ND	14	15		1	104	50-150	06/21/2023 2144
PFHxS	ND	13	14		1	105	50-150	06/21/2023 2144
PFBA	ND	15	15		1	103	50-150	06/21/2023 2144
PFDA	ND	15	15		1	103	50-150	06/21/2023 2144
PFDoA	ND	15	16		1	106	50-150	06/21/2023 2144
PFHpA	ND	15	15		1	103	50-150	06/21/2023 2144
PFHxA	ND	15	15		1	104	50-150	06/21/2023 2144
PFNA	ND	15	16		1	106	50-150	06/21/2023 2144
PFOA	ND	15	15		1	104	50-150	06/21/2023 2144
PFPeA	ND	15	16		1	106	50-150	06/21/2023 2144
PFTeDA	ND	15	16		1	106	50-150	06/21/2023 2144
PFTrDA	ND	15	16		1	108	50-150	06/21/2023 2144
PFUdA	ND	15	15		1	98	50-150	06/21/2023 2144
PFOS	ND	14	15		1	107	50-150	06/21/2023 2144

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		113	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		72	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YE30011-008MS
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		96	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YE30011-008MD
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	14		1	101	3.2	50-150	30	06/21/2023 2157
11Cl-PF3OUdS	ND	14	14		1	103	8.2	50-150	30	06/21/2023 2157
8:2 FTS	ND	14	16		1	110	9.8	50-150	30	06/21/2023 2157
6:2 FTS	ND	14	15		1	105	1.1	50-150	30	06/21/2023 2157
4:2 FTS	ND	14	14		1	104	1.3	50-150	30	06/21/2023 2157
GenX	ND	30	30		1	101	5.5	50-150	30	06/21/2023 2157
ADONA	ND	14	14		1	98	2.9	50-150	30	06/21/2023 2157
EtFOSAA	ND	15	16		1	106	8.8	50-150	30	06/21/2023 2157
MeFOSAA	ND	15	15		1	104	3.9	50-150	30	06/21/2023 2157
PFBS	1.4	13	15		1	102	0.21	50-150	30	06/21/2023 2157
PFDS	ND	14	14		1	97	3.4	50-150	30	06/21/2023 2157
PFHpS	ND	14	14		1	101	1.7	50-150	30	06/21/2023 2157
PFNS	ND	14	14		1	96	0.090	50-150	30	06/21/2023 2157
PFOSA	0.65	15	16		1	103	3.4	50-150	30	06/21/2023 2157
PFPeS	ND	14	14		1	100	4.4	50-150	30	06/21/2023 2157
PFHxS	ND	14	14		1	102	2.7	50-150	30	06/21/2023 2157
PFBA	ND	15	15		1	104	1.3	50-150	30	06/21/2023 2157
PFDA	ND	15	15		1	103	0.63	50-150	30	06/21/2023 2157
PFDoA	ND	15	16		1	108	2.1	50-150	30	06/21/2023 2157
PFHpA	ND	15	15		1	103	0.58	50-150	30	06/21/2023 2157
PFHxA	ND	15	15		1	98	5.5	50-150	30	06/21/2023 2157
PFNA	ND	15	15		1	100	5.5	50-150	30	06/21/2023 2157
PFOA	ND	15	15		1	104	0.062	50-150	30	06/21/2023 2157
PFPeA	ND	15	15		1	102	3.5	50-150	30	06/21/2023 2157
PFTeDA	ND	15	16		1	105	1.2	50-150	30	06/21/2023 2157
PFTrDA	ND	15	15		1	104	4.2	50-150	30	06/21/2023 2157
PFUdA	ND	15	16		1	110	12	50-150	30	06/21/2023 2157
PFOS	ND	14	14		1	102	4.0	50-150	30	06/21/2023 2157

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		115	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		102	25-150
13C4_PFBA		71	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YE30011-008MD
Batch: 77628
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/14/2023 1526

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		98	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical

Plant Co

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 141875

Client: Arcadis	Report to Contact: Tiffany Lindar, Kaitlyn Hunt	Telephone No. / E-mail: kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, STE500	Sampler's Signature: Kaitlyn Hunt	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Novi / State: MI / Zip Code: 48377	Printed Name: Kaitlyn Hunt		Lot # Bar Code (lab use only): YE30011
Project Name: RACER Lansing GWS			
Project No.: 30171056.0370A	P.O. No.: WS346000115		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Soil/Solid	Matrix: Wipe	Matrix: Oil	No. of Containers by Preservative Type: Unpres	HNO3	NaOH	HCl	NaOH/ZnAc	Other	Filtered	PFAS 537 MW 537.1 Modified	Lot # Bar Code
MW-20-131_052323	5/23/23	1535	G	X				2							2	
MW-20-132_052323	5/23/23	1710	G	X				2							2	
MW-22-152_052323	5/23/23	1640	G	X				2							2	
MW-22-151_052323	5/23/23	1810	G	X				2							2	
MW-21-135_052423	5/24/23	850	G	X				2							2	
MW-21-134_052423	5/24/23	1005	G	X				2							2	
MW-21-133_052423	5/24/23	1125	G	X				2							2	
MW-22-148_052423	5/24/23	845	G	X				6							6	MS/MSD
DUP-08_052323	5/23/23	—	G	X				2							2	
DUP-07_052323	5/23/23	—	G	X				2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Arcadis	5/25/23	0940	1. Received by: FedEx	5/25/23	0940
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	5/30/23	0940	4. Laboratory received by: Cindy Rend	5/30/23	0940

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No Ice Pack — Receipt Temp: 8.3 °C — Temp Blank: ☐ Y ☒ N

Melted

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

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Pace Analytical
Plant 6

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 141876

Client: Arcadis	Report to Contact: Kaitlyn Hunt / Tiffany Linder	Telephone No. / E-mail: kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Dr STE 500	Sampler's Signature: x Kaitlyn Hunt	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Novi / State: MI / Zip Code: 48377	Printed Name: Kaitlyn Hunt		
Project Name: RACER Lansing GWS			YE30011
Project No.: 30171056.0370A	P.O. No.: MS3460008115		KBSD

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Soil	Air/Vapor	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Other	537.1/ EPA 1633 PFAS	Remarks / Cooler I.D.
MW-22-150_052423	5/24/23	1005	G	X			2							2	
MW-12-12_052423	5/24/23	1120	G	X			2							2	
MW-12-13_052423	5/24/23	1245	G	X			2							2	
MW-13-30R_052423	5/24/23	1235	G	X			2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT): X Standard ☐ Rush (Specify)	Sample Disposal: ☐ Return to Client ☐ Disposal by Lab	Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown		QC Requirements (Specify)			
1. Relinquished by: Quinton Hardisty / Arcadis	Date: 5/25/23	Time: 0940	1. Received by: FedEx	Date: 5/25/23	Time: 0940		
2. Relinquished by	Date	Time	2. Received by	Date	Time		
3. Relinquished by	Date	Time	3. Received by	Date	Time		
4. Relinquished by: FedEx	Date: 5/30/23	Time: 0940	4. Laboratory received by: [signature]	Date: 5/30/23	Time: 0940		
Note: All samples are retained for four weeks from receipt unless other arrangements are made.			LAB USE ONLY: Received on ice (Circle) (Yes) No Ice Pack	Receipt Temp.: 18.3 °C	Temp Blank: ☐ Y ☐ N		

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Melrd

Document Number: ME603N2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: PLANT CO Cooler Inspected by/date: CDR / 5/30/23 Lot #: YE30011

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

18.3 / 18.3 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments: Ice received melted, air bill says it was supposed to be here on Friday 05/26/23

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Marina Samp

Project Name: RACER Lansing

Project Number: 30171056.0370B

Lot Number:**YD26014**

Date Completed:05/22/2023

Project Manager:**Kathy E. Smith**

05/22/2023 3:54 PM
Approved and released by:
Project Manager II: **Edward Barnett**

The electronic signature above is the equivalent of a handwritten signature.
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Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YD26014

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 180.1, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform. Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM2520 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011, Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B. Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,4-Dioxane, 1,3,5-Trinitrobenzene, 1,4- Naphthoquinone, 1,4-Phenylenediamine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4-Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12-Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5- Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS

Samples YD26014-004, YD26014-006 and YD26014-007 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Samples YD26014-009 and YD26014-010 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YD26014-009, YD26014-010. The samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside the upper control limit: YD26014-001, YD26014-002, YD26014-003, YD26014-004, YD26014-005, YD26014-006, YD26014-007, YD26014-008. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YD26014

Project Name: RACER Lansing

Project Number: 30171056.0370B

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YD26014-001	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-001	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YD26014-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-004	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-005	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YD26014-005	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-dodecanoic acid (PFDoA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YD26014-005	1	Perfluorooctanesulfonic acid (PFOS)	M-03

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YD26014

Project Name: RACER Lansing

Project Number: 30171056.0370B

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YD26014-006	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-006	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-006	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YD26014-006	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YD26014-006	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-006	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-007	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-007	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-007	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-007	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-007	1	13C2_PFDoA	M-03
PFAS by ID SOP	YD26014-008	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-008	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YD26014-008	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-008	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-009	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YD26014-010	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YQ74756-002	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YD26014-001MS	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YD26014-001MD	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YQ74756-002	1	1H,1H,2H,2H-perfluorohexane sulfonic	M-03
PFAS by ID SOP	YQ74756-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YD26014-001MS	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YD26014-001MD	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YQ74756-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YD26014-001MS	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YD26014-001MD	1	N-methylperfluoro-1-	M-03

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YD26014

Project Name: RACER Lansing

Project Number: 30171056.0370B

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YD26014-001MD	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-1-decanesulfonic acid (PFDS)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluoro-1-nonanesulfonic acid (PFNS)	M-03
PFAS by ID SOP	YD26014-001MD	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluoro-n-dodecanoic acid (PFDoA)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-n-tridecanoic acid (PFTrDA)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	YQ74756-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-001MS	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-001MD	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YD26014-001MD	1	13C2_8:2FTS	M-03
PFAS by ID SOP	YQ74943-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YQ74943-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YQ74943-001	1	13C2_8:2FTS	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary
Arcadis U.S., Inc.
Lot Number: YD26014
Project Name: RACER Lansing
Project Number: 30171056.0370B

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MichAve-MH-3_042523	Aqueous	04/25/2023 0840	04/26/2023
002	Verlinden-MH-5_042523	Aqueous	04/25/2023 0855	04/26/2023
003	Osborn-MH-1_042523	Aqueous	04/25/2023 0920	04/26/2023
004	Dup-01_042523	Aqueous	04/25/2023	04/26/2023
005	Osborn-MH-1_SW_042523	Aqueous	04/25/2023 0925	04/26/2023
006	Osborn-MH-1_SE_042523	Aqueous	04/25/2023 0930	04/26/2023
007	Osborn-CB-2_042523	Aqueous	04/25/2023 0945	04/26/2023
008	P3-MH-284_042523	Aqueous	04/25/2023 1015	04/26/2023
009	P2-MH-2_042523	Aqueous	04/25/2023 1045	04/26/2023
010	P2-MH-W_042523	Aqueous	04/25/2023 1120	04/26/2023
011	FB-01_042523	Aqueous	04/25/2023 1148	04/26/2023
012	EB-01_042523	Aqueous	04/25/2023 1145	04/26/2023

(12 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YD26014

Project Name: RACER Lansing

Project Number: 30171056.0370B

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MichAve-MH-3_042523	Aqueous	PFBS	PFAS by ID	3.7	JM-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFHxS	PFAS by ID	4.0	M-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFBA	PFAS by ID	8.4	M-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFHpA	PFAS by ID	2.7	JM-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFHxA	PFAS by ID	4.0		ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFOA	PFAS by ID	4.4	M-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFPeA	PFAS by ID	4.0	M-03	ng/L	12
001	MichAve-MH-3_042523	Aqueous	PFOS	PFAS by ID	2.4	JM-03	ng/L	12
002	Verlinden-MH-5_042523	Aqueous	PFBS	PFAS by ID	4.0	M-03	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFHxS	PFAS by ID	1.4	JM-03	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFBA	PFAS by ID	12		ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFDA	PFAS by ID	1.4	JM-03	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFHpA	PFAS by ID	17		ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFHxA	PFAS by ID	22	M-03	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFNA	PFAS by ID	3.2	J	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFOA	PFAS by ID	31	M-03	ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFPeA	PFAS by ID	19		ng/L	14
002	Verlinden-MH-5_042523	Aqueous	PFOS	PFAS by ID	13	M-03	ng/L	14
003	Osborn-MH-1_042523	Aqueous	PFBS	PFAS by ID	1.4	JM-03	ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFHxS	PFAS by ID	1.9	JM-03	ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFBA	PFAS by ID	15	M-03	ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFDA	PFAS by ID	5.5		ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFHpA	PFAS by ID	13	M-03	ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFHxA	PFAS by ID	18		ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFNA	PFAS by ID	4.7	M-03	ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFOA	PFAS by ID	26		ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFPeA	PFAS by ID	14		ng/L	16
003	Osborn-MH-1_042523	Aqueous	PFOS	PFAS by ID	16	M-03	ng/L	16
004	Dup-01_042523	Aqueous	PFBS	PFAS by ID	1.6	JM-03	ng/L	18
004	Dup-01_042523	Aqueous	PFHxS	PFAS by ID	1.8	JM-03	ng/L	18
004	Dup-01_042523	Aqueous	PFBA	PFAS by ID	17	M-03	ng/L	18
004	Dup-01_042523	Aqueous	PFDA	PFAS by ID	5.6		ng/L	18
004	Dup-01_042523	Aqueous	PFHpA	PFAS by ID	13	M-03	ng/L	18
004	Dup-01_042523	Aqueous	PFHxA	PFAS by ID	16		ng/L	18
004	Dup-01_042523	Aqueous	PFNA	PFAS by ID	4.5	M-03	ng/L	18
004	Dup-01_042523	Aqueous	PFOA	PFAS by ID	25	M-03	ng/L	18
004	Dup-01_042523	Aqueous	PFPeA	PFAS by ID	14	M-03	ng/L	18
004	Dup-01_042523	Aqueous	PFOS	PFAS by ID	16	M-03	ng/L	18
005	Osborn-MH-1_SW_042523	Aqueous	EtFOSAA	PFAS by ID	2.0	JM-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFHxS	PFAS by ID	1.9	JM-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFBA	PFAS by ID	23	M-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFDA	PFAS by ID	11	M-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFHpA	PFAS by ID	18	M-03	ng/L	20

Detection Summary (Continued)

Lot Number: YD26014

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	Osborn-MH-1_SW_042523	Aqueous	PFHxA	PFAS by ID	20		ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFNA	PFAS by ID	7.4		ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFOA	PFAS by ID	32	M-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFPeA	PFAS by ID	20	M-03	ng/L	20
005	Osborn-MH-1_SW_042523	Aqueous	PFOS	PFAS by ID	25	M-03	ng/L	20
006	Osborn-MH-1_SE_042523	Aqueous	PFBS	PFAS by ID	1.5	JM-03	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFHxS	PFAS by ID	1.7	JM-03	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFBA	PFAS by ID	9.2		ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFDA	PFAS by ID	1.5	J	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFHpA	PFAS by ID	4.8	M-03	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFHxA	PFAS by ID	7.1		ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFNA	PFAS by ID	1.5	JM-03	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFOA	PFAS by ID	16		ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFPeA	PFAS by ID	5.8	M-03	ng/L	22
006	Osborn-MH-1_SE_042523	Aqueous	PFOS	PFAS by ID	16	M-03	ng/L	22
007	Osborn-CB-2_042523	Aqueous	PFBS	PFAS by ID	1.0	JM-03	ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFHxS	PFAS by ID	1.2	JM-03	ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFBA	PFAS by ID	15		ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFDA	PFAS by ID	1.0	J	ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFHpA	PFAS by ID	9.7		ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFHxA	PFAS by ID	15		ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFNA	PFAS by ID	3.7	J	ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFOA	PFAS by ID	26	M-03	ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFPeA	PFAS by ID	9.8		ng/L	24
007	Osborn-CB-2_042523	Aqueous	PFOS	PFAS by ID	15	M-03	ng/L	24
008	P3-MH-284_042523	Aqueous	PFBS	PFAS by ID	2.3	JM-03	ng/L	26
008	P3-MH-284_042523	Aqueous	PFBA	PFAS by ID	3.1	J	ng/L	26
008	P3-MH-284_042523	Aqueous	PFHxA	PFAS by ID	1.7	JM-03	ng/L	26
008	P3-MH-284_042523	Aqueous	PFOA	PFAS by ID	2.1	JM-03	ng/L	26
008	P3-MH-284_042523	Aqueous	PFPeA	PFAS by ID	1.9	J	ng/L	26
008	P3-MH-284_042523	Aqueous	PFOS	PFAS by ID	5.9	M-03	ng/L	26
009	P2-MH-2_042523	Aqueous	PFBS	PFAS by ID	1.5	JM-03	ng/L	28
009	P2-MH-2_042523	Aqueous	PFHxS	PFAS by ID	1.6	JM-03	ng/L	28
009	P2-MH-2_042523	Aqueous	PFBA	PFAS by ID	9.3	M-03	ng/L	28
009	P2-MH-2_042523	Aqueous	PFHpA	PFAS by ID	3.3	J	ng/L	28
009	P2-MH-2_042523	Aqueous	PFHxA	PFAS by ID	5.4		ng/L	28
009	P2-MH-2_042523	Aqueous	PFOA	PFAS by ID	8.2	M-03	ng/L	28
009	P2-MH-2_042523	Aqueous	PFPeA	PFAS by ID	4.7	M-03	ng/L	28
009	P2-MH-2_042523	Aqueous	PFOS	PFAS by ID	6.4	M-03	ng/L	28
010	P2-MH-W_042523	Aqueous	PFBS	PFAS by ID	1.1	JM-03	ng/L	30
010	P2-MH-W_042523	Aqueous	PFHxS	PFAS by ID	1.1	JM-03	ng/L	30
010	P2-MH-W_042523	Aqueous	PFBA	PFAS by ID	4.4	M-03	ng/L	30
010	P2-MH-W_042523	Aqueous	PFHxA	PFAS by ID	1.2	JM-03	ng/L	30
010	P2-MH-W_042523	Aqueous	PFOA	PFAS by ID	2.0	J	ng/L	30
010	P2-MH-W_042523	Aqueous	PFPeA	PFAS by ID	1.5	JM-03	ng/L	30
010	P2-MH-W_042523	Aqueous	PFOS	PFAS by ID	1.7	JM-03	ng/L	30
012	EB-01_042523	Aqueous	6:2 FTS	PFAS by ID	4.8	J	ng/L	34

Detection Summary (Continued)

Lot Number: YD26014

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page

(90 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-001**

Description: **MichAve-MH-3_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0840** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 1909	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	S	7.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.9	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.7**	**JM-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.0**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.4**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.7**	**JM-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.0**		**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.4**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.0**	**M-03**	**4.0**	**0.99**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.4**	**JM-03**	**4.0**	**0.99**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	298	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		97	50-150
13C4_PFBA		53	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-001**

Description: **MichAve-MH-3_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0840** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		115	50-150
13C8_PFOS		102	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-002**

Description: **Verlinden-MH-5_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0855** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 1941	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.0**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**22**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.2**	**J**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**31**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**19**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**13**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	277	50-150
13C2_6:2FTS		115	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		63	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-002**

Description: **Verlinden-MH-5_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0855** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-003**

Description: **Osborn-MH-1_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0920** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 1951	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**5.5**		**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**13**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**18**		**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.7**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**		**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**16**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	344	50-150
13C2_6:2FTS	N	215	50-150
13C2_8:2FTS	N	212	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		63	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		121	50-150
13C7_PFUdA		107	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YD26014-003**
Description: **Osborn-MH-1_042523**		Matrix: **Aqueous**
Date Sampled: **04/25/2023 0920**	Project Name: **RACER Lansing**	
Date Received: **04/26/2023**	Project Number: **30171056.0370B**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		129	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		99	50-150
13C9_PFNA		120	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		126	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-004**

Description: **Dup-01_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 2002	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**17**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**5.6**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**13**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**16**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.5**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**25**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**16**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	318	50-150
13C2_6:2FTS	N	195	50-150
13C2_8:2FTS	N	159	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		97	50-150
13C3-HFPO-DA		83	50-150
13C4_PFBA		58	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		109	50-150
13C7_PFUdA		102	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YD26014-004**
Description: **Dup-01_042523**		Matrix: **Aqueous**
Date Sampled: **04/25/2023**	Project Name: **RACER Lansing**	
Date Received: **04/26/2023**	Project Number: **30171056.0370B**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		129	50-150
13C8_PFOS		97	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		122	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-005**

Description: **Osborn-MH-1_SW_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0925** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/18/2023 1234	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.5	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.5	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**2.0**	**JM-03**	**7.5**	**1.9**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**JM-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**23**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**11**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	M-03	3.7	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**18**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**20**		**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.4**		**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**32**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**20**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	M-03	3.7	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**25**	**M-03**	**3.7**	**0.94**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	318	50-150
13C2_6:2FTS	N	388	50-150
13C2_8:2FTS	N	267	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		69	50-150
13C4_PFBA		51	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		86	50-150
13C5_PFPeA		77	50-150
13C6_PFDA		114	50-150
13C7_PFUdA		118	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YD26014-005**
Description: **Osborn-MH-1_SW_042523**
Matrix: **Aqueous**
Date Sampled: **04/25/2023 0925**
Project Name: **RACER Lansing**
Date Received: **04/26/2023**
Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		116	50-150
13C8_PFOS		101	50-150
13C8_PFOSA		103	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		133	50-150
d3-MeFOSAA		123	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-006**

Description: **Osborn-MH-1_SE_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0930** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 2045	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.2**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.5**	**J**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.8**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.1**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.8**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**16**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	204	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		78	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YD26014-006**
Description: **Osborn-MH-1_SE_042523**
Matrix: **Aqueous**
Date Sampled: **04/25/2023 0930**
Project Name: **RACER Lansing**
Date Received: **04/26/2023**
Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		111	50-150
13C8_PFOS		93	50-150
13C8_PFOSA		80	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-007**

Description: **Osborn-CB-2_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 0945** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 2055	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.7	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**JM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.2**	**JM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.0**	**J**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.7**		**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.7**	**J**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.8**		**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**15**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	257	50-150
13C2_6:2FTS	N	154	50-150
13C2_8:2FTS		134	50-150
13C2_PFDoA	M-03	90	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		84	50-150
13C4_PFBA		66	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YD26014-007**
Description: **Osborn-CB-2_042523**
Matrix: **Aqueous**
Date Sampled: **04/25/2023 0945**
Project Name: **RACER Lansing**
Date Received: **04/26/2023**
Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		113	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		90	50-150
13C9_PFNA		113	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		109	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-008**

Description: **P3-MH-284_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1015** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/17/2023 2106	ALM	05/08/2023 1800	74756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.7**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.1**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.9**	**J**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.9**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	342	50-150
13C2_6:2FTS	N	298	50-150
13C2_8:2FTS	N	278	50-150
13C2_PFDoA		113	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		99	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		55	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		124	50-150
13C7_PFUdA		114	50-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YD26014-008**
Description: **P3-MH-284_042523**		Matrix: **Aqueous**
Date Sampled: **04/25/2023 1015**	Project Name: **RACER Lansing**	
Date Received: **04/26/2023**	Project Number: **30171056.0370B**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		124	50-150
13C8_PFOS		102	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		120	50-150
d5-EtFOSAA		141	50-150
d3-MeFOSAA		131	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-009**

Description: **P2-MH-2_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1045** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/12/2023 0229	ARC2	05/10/2023 1430	74943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.6**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.3**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.3**	**J**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.4**		**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.2**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.7**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**6.4**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	266	50-150
13C2_6:2FTS	N	209	50-150
13C2_8:2FTS	N	174	50-150
13C2_PFDoA		108	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		113	50-150
13C3-HFPO-DA		105	50-150
13C4_PFBA		59	50-150
13C4_PFHpA		115	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		117	50-150
13C7_PFUdA		110	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YD26014-009**
Description: **P2-MH-2_042523**
Matrix: **Aqueous**
Date Sampled: **04/25/2023 1045**
Project Name: **RACER Lansing**
Date Received: **04/26/2023**
Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		120	50-150
13C8_PFOS		116	50-150
13C8_PFOSA		108	50-150
13C9_PFNA		122	50-150
d5-EtFOSAA		128	50-150
d3-MeFOSAA		132	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-010**

Description: **P2-MH-W_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1120** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/12/2023 0241	ARC2	05/10/2023 1430	74943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.4**	**M-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.2**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.0**	**J**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.5**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7**	**JM-03**	**3.9**	**0.98**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	175	50-150
13C2_6:2FTS		112	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		73	50-150
13C3_PFBS		115	50-150
13C3_PFHxS		118	50-150
13C3-HFPO-DA		112	50-150
13C4_PFBA		72	50-150
13C4_PFHpA		116	50-150
13C5_PFHxA		124	50-150
13C5_PFPeA		109	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		94	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YD26014-010**
Description: **P2-MH-W_042523**		Matrix: **Aqueous**
Date Sampled: **04/25/2023 1120**	Project Name: **RACER Lansing**	
Date Received: **04/26/2023**	Project Number: **30171056.0370B**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		117	50-150
13C8_PFOS		108	50-150
13C8_PFOSA		100	50-150
13C9_PFNA		115	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-011**

Description: **FB-01_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1148** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/12/2023 0254	ARC2	05/10/2023 1430	74943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		105	50-150
13C2_6:2FTS		98	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		106	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		111	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		110	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		112	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		104	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YD26014-011**
Description: **FB-01_042523**		Matrix: **Aqueous**
Date Sampled: **04/25/2023 1148**	Project Name: **RACER Lansing**	
Date Received: **04/26/2023**	Project Number: **30171056.0370B**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		112	50-150
13C8_PFOS		103	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		110	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-012**

Description: **EB-01_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1145** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	05/12/2023 0307	ARC2	05/10/2023 1430	74943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**4.8**	**J**	**8.8**	**2.2**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.8	2.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.4	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.4	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		109	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		110	50-150
13C2_PFTeDA		110	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		111	50-150
13C3-HFPO-DA		109	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		112	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		116	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		106	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YD26014-012**

Description: **EB-01_042523** Matrix: **Aqueous**

Date Sampled: **04/25/2023 1145** Project Name: **RACER Lansing**

Date Received: **04/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		115	50-150
13C8_PFOS		112	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		117	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		115	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ74756-001
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	2.0	ng/L	05/17/2023 1848
11Cl-PF3OUdS	ND		1	8.0	2.0	ng/L	05/17/2023 1848
8:2 FTS	ND		1	8.0	2.0	ng/L	05/17/2023 1848
6:2 FTS	ND		1	8.0	2.0	ng/L	05/17/2023 1848
4:2 FTS	ND		1	8.0	2.0	ng/L	05/17/2023 1848
GenX	ND		1	8.0	2.0	ng/L	05/17/2023 1848
ADONA	ND		1	8.0	2.0	ng/L	05/17/2023 1848
EtFOSAA	ND		1	8.0	2.0	ng/L	05/17/2023 1848
MeFOSAA	ND		1	8.0	2.0	ng/L	05/17/2023 1848
PFBS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFDS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFHpS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFNS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFOSA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFPeS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFHxS	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFBA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFDA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFDoA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFHpA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFHxA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFNA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFOA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFPeA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFTeDA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFTrDA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFUdA	ND		1	4.0	1.0	ng/L	05/17/2023 1848
PFOS	ND		1	4.0	1.0	ng/L	05/17/2023 1848

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		104	50-150
13C2_6:2FTS		77	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		107	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ74756-001
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		106	50-150
13C8_PFOS		91	50-150
13C8_PFOSA		89	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ74756-002
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	17		1	116	50-150	05/17/2023 1858
11Cl-PF3OUdS	15	17		1	110	50-150	05/17/2023 1858
8:2 FTS	15	15		1	100	67-138	05/17/2023 1858
6:2 FTS	15	17	M-03	1	115	64-140	05/17/2023 1858
4:2 FTS	15	20	M-03	1	132	63-143	05/17/2023 1858
GenX	32	31		1	98	50-150	05/17/2023 1858
ADONA	15	17		1	110	50-150	05/17/2023 1858
EtFOSAA	16	19	M-03	1	120	61-135	05/17/2023 1858
MeFOSAA	16	17	M-03	1	106	65-136	05/17/2023 1858
PFBS	14	15		1	103	72-130	05/17/2023 1858
PFDS	15	17	M-03	1	111	53-142	05/17/2023 1858
PFHpS	15	15		1	99	69-134	05/17/2023 1858
PFNS	15	19		1	121	69-127	05/17/2023 1858
PFOSA	16	16		1	103	67-137	05/17/2023 1858
PFPeS	15	16		1	109	71-127	05/17/2023 1858
PFHxS	15	14		1	98	68-131	05/17/2023 1858
PFBA	16	18		1	110	73-129	05/17/2023 1858
PFDA	16	17		1	106	71-129	05/17/2023 1858
PFDoA	16	19		1	121	72-134	05/17/2023 1858
PFHpA	16	18	M-03	1	112	72-130	05/17/2023 1858
PFHxA	16	18	M-03	1	110	72-129	05/17/2023 1858
PFNA	16	18		1	111	69-130	05/17/2023 1858
PFOA	16	19		1	122	71-133	05/17/2023 1858
PFPeA	16	17		1	109	72-129	05/17/2023 1858
PFTeDA	16	18	M-03	1	115	71-132	05/17/2023 1858
PFTrDA	16	16	M-03	1	100	65-144	05/17/2023 1858
PFUdA	16	18	M-03	1	115	69-133	05/17/2023 1858
PFOS	15	18	M-03	1	119	65-140	05/17/2023 1858

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	50-150
13C2_6:2FTS		74	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		83	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ74756-002
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		97	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YD26014-001MS
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	16		1	111	50-150	05/17/2023 1920
11Cl-PF3OUdS	ND	14	15		1	101	50-150	05/17/2023 1920
8:2 FTS	ND	15	17		1	116	67-138	05/17/2023 1920
6:2 FTS	ND	15	15	M-03	1	105	64-140	05/17/2023 1920
4:2 FTS	ND	14	15		1	104	63-143	05/17/2023 1920
GenX	ND	31	38		1	126	50-150	05/17/2023 1920
ADONA	ND	14	16		1	110	50-150	05/17/2023 1920
EtFOSAA	ND	15	15	M-03	1	98	61-135	05/17/2023 1920
MeFOSAA	ND	15	16	M-03	1	105	65-136	05/17/2023 1920
PFBS	3.7	14	17		1	99	72-130	05/17/2023 1920
PFDS	ND	15	15		1	98	53-142	05/17/2023 1920
PFHpS	ND	15	17		1	118	69-134	05/17/2023 1920
PFNS	ND	15	16	M-03	1	112	69-127	05/17/2023 1920
PFOSA	ND	15	17		1	109	67-137	05/17/2023 1920
PFPeS	ND	14	18		1	124	71-127	05/17/2023 1920
PFHxS	4.0	14	18		1	99	68-131	05/17/2023 1920
PFBA	8.4	15	27		1	125	73-129	05/17/2023 1920
PFDA	ND	15	17		1	110	71-129	05/17/2023 1920
PFDoA	ND	15	16	M-03	1	107	72-134	05/17/2023 1920
PFHpA	2.7	15	20		1	115	72-130	05/17/2023 1920
PFHxA	4.0	15	21		1	111	72-129	05/17/2023 1920
PFNA	ND	15	17	M-03	1	110	69-130	05/17/2023 1920
PFOA	4.4	15	21	M-03	1	110	71-133	05/17/2023 1920
PFPeA	4.0	15	21		1	111	72-129	05/17/2023 1920
PFTeDA	ND	15	16		1	103	71-132	05/17/2023 1920
PFTrDA	ND	15	15		1	98	65-144	05/17/2023 1920
PFUdA	ND	15	17	M-03	1	109	69-133	05/17/2023 1920
PFOS	2.4	14	20	M-03	1	127	65-140	05/17/2023 1920

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	289	50-150
13C2_6:2FTS		125	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		82	50-150
13C4_PFBA		51	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YD26014-001MS
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		108	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		86	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YD26014-001MD
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	15	17		1	111	5.6	50-150	30	05/17/2023 1930
11Cl-PF3OUdS	ND	15	14		1	93	3.8	50-150	30	05/17/2023 1930
8:2 FTS	ND	15	23	N	1	148	29	67-138	30	05/17/2023 1930
6:2 FTS	ND	15	18	M-03	1	118	17	64-140	30	05/17/2023 1930
4:2 FTS	ND	15	17		1	110	11	63-143	30	05/17/2023 1930
GenX	ND	32	38		1	119	0.35	50-150	30	05/17/2023 1930
ADONA	ND	15	17		1	113	6.8	50-150	30	05/17/2023 1930
EtFOSAA	ND	16	17	M-03	1	104	11	61-135	30	05/17/2023 1930
MeFOSAA	ND	16	19	M-03	1	117	16	65-136	30	05/17/2023 1930
PFBS	3.7	14	18	M-03	1	101	5.7	72-130	30	05/17/2023 1930
PFDS	ND	15	15		1	96	2.6	53-142	30	05/17/2023 1930
PFHpS	ND	15	18		1	121	7.3	69-134	30	05/17/2023 1930
PFNS	ND	15	17		1	107	0.76	69-127	30	05/17/2023 1930
PFOSA	ND	16	17		1	107	2.8	67-137	30	05/17/2023 1930
PFPeS	ND	15	17		1	114	3.4	71-127	30	05/17/2023 1930
PFHxS	4.0	15	19	M-03	1	101	5.3	68-131	30	05/17/2023 1930
PFBA	8.4	16	28		1	125	3.4	73-129	30	05/17/2023 1930
PFDA	ND	16	18		1	112	6.2	71-129	30	05/17/2023 1930
PFDoA	ND	16	19		1	118	15	72-134	30	05/17/2023 1930
PFHpA	2.7	16	20		1	109	0.84	72-130	30	05/17/2023 1930
PFHxA	4.0	16	20		1	101	3.5	72-129	30	05/17/2023 1930
PFNA	ND	16	19		1	118	12	69-130	30	05/17/2023 1930
PFOA	4.4	16	22		1	108	2.7	71-133	30	05/17/2023 1930
PFPeA	4.0	16	21		1	108	1.4	72-129	30	05/17/2023 1930
PFTeDA	ND	16	17		1	104	5.9	71-132	30	05/17/2023 1930
PFTrDA	ND	16	15		1	96	2.2	65-144	30	05/17/2023 1930
PFUdA	ND	16	18		1	114	9.1	69-133	30	05/17/2023 1930
PFOS	2.4	15	19	M-03	1	112	7.0	65-140	30	05/17/2023 1930

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	324	50-150
13C2_6:2FTS		134	50-150
13C2_8:2FTS	M-03	105	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		76	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		105	50-150
13C3-HFPO-DA		90	50-150
13C4_PFBA		51	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		88	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YD26014-001MD
Batch: 74756
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/08/2023 1800

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		93	50-150
13C8_PFOA		119	50-150
13C8_PFOS		99	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ74943-001
Batch: 74943
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/10/2023 1430

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	2.0	ng/L	05/12/2023 0125
11Cl-PF3OUdS	ND		1	8.0	2.0	ng/L	05/12/2023 0125
8:2 FTS	ND		1	8.0	2.0	ng/L	05/12/2023 0125
6:2 FTS	ND		1	8.0	2.0	ng/L	05/12/2023 0125
4:2 FTS	ND		1	8.0	2.0	ng/L	05/12/2023 0125
GenX	ND		1	8.0	2.0	ng/L	05/12/2023 0125
ADONA	ND		1	8.0	2.0	ng/L	05/12/2023 0125
EtFOSAA	ND		1	8.0	2.0	ng/L	05/12/2023 0125
MeFOSAA	ND		1	8.0	2.0	ng/L	05/12/2023 0125
PFBS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFDS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFHpS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFNS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFOSA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFPeS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFHxS	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFBA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFDA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFDoA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFHpA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFHxA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFNA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFOA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFPeA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFTeDA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFTrDA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFUdA	ND		1	4.0	1.0	ng/L	05/12/2023 0125
PFOS	ND		1	4.0	1.0	ng/L	05/12/2023 0125

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS	M-03	121	50-150
13C2_PFDoA		112	50-150
13C2_PFTeDA		108	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		114	50-150
13C3-HFPO-DA		114	50-150
13C4_PFBA		115	50-150
13C4_PFHpA		110	50-150
13C5_PFHxA		117	50-150
13C5_PFPeA		121	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ74943-001
Batch: 74943
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/10/2023 1430

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		109	50-150
13C7_PFUdA		108	50-150
13C8_PFOA		112	50-150
13C8_PFOS		123	50-150
13C8_PFOSA		104	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		113	50-150
d3-MeFOSAA		112	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ74943-002
Batch: 74943
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/10/2023 1430

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	50-150	05/12/2023 0138
11Cl-PF3OUdS	15	15		1	97	50-150	05/12/2023 0138
8:2 FTS	15	15		1	101	67-138	05/12/2023 0138
6:2 FTS	15	15		1	102	64-140	05/12/2023 0138
4:2 FTS	15	15		1	98	63-143	05/12/2023 0138
GenX	32	32		1	99	50-150	05/12/2023 0138
ADONA	15	15		1	101	50-150	05/12/2023 0138
EtFOSAA	16	16	M-03	1	98	61-135	05/12/2023 0138
MeFOSAA	16	16		1	101	65-136	05/12/2023 0138
PFBS	14	13		1	94	72-130	05/12/2023 0138
PFDS	15	15		1	100	53-142	05/12/2023 0138
PFHpS	15	15		1	96	69-134	05/12/2023 0138
PFNS	15	15		1	97	69-127	05/12/2023 0138
PFOSA	16	15		1	94	67-137	05/12/2023 0138
PFPeS	15	14		1	95	71-127	05/12/2023 0138
PFHxS	15	14		1	99	68-131	05/12/2023 0138
PFBA	16	15		1	95	73-129	05/12/2023 0138
PFDA	16	15		1	97	71-129	05/12/2023 0138
PFDoA	16	17		1	105	72-134	05/12/2023 0138
PFHpA	16	16		1	101	72-130	05/12/2023 0138
PFHxA	16	16		1	102	72-129	05/12/2023 0138
PFNA	16	16		1	101	69-130	05/12/2023 0138
PFOA	16	16		1	98	71-133	05/12/2023 0138
PFPeA	16	15		1	94	72-129	05/12/2023 0138
PFTeDA	16	14		1	91	71-132	05/12/2023 0138
PFTrDA	16	17		1	106	65-144	05/12/2023 0138
PFUdA	16	16		1	100	69-133	05/12/2023 0138
PFOS	15	14	M-03	1	94	65-140	05/12/2023 0138

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		108	50-150
13C2_6:2FTS		101	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		109	50-150
13C2_PFTeDA		109	50-150
13C3_PFBS		113	50-150
13C3_PFHxS		112	50-150
13C3-HFPO-DA		112	50-150
13C4_PFBA		113	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		118	50-150

LOQ = Limit of Quantitation
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* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ74943-002
Batch: 74943
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 05/10/2023 1430

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		107	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		116	50-150
13C8_PFOS		115	50-150
13C8_PFOSA		109	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		113	50-150
d3-MeFOSAA		113	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical®

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106 Vantage Point Drive • West Columbia, SC 29172
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Number 145093

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 / marina.samp@arcadis	Quote No.
Address: 28550 Cabot Dr. Ste 500	Sampler's Signature: x Amyssa Mandich	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Novi State: MI Zip Code: 48377	Printed Name: Amyssa Mandich		
Project Name: RACER Lansing PFAS Delineation			
Project No.: 30171056.0370B	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	# Grab Composite	Matrix: Aqueous	Soil	Other	No. of Containers by Preservative Type: Unpres.	HNO3	H2SO4	NaOH	ZnAc/ NaOH	Other	EPA 537 M/PFAS (Mr. List of 28)	Remarks / Cooler I.D.
MichAve-MH-3_042523	4/25/23	0840	6	X			6						6	MS/MSD
Vertinder-MH-5_042523	4/25/23	0855	6	X			2						4	
Osborn-MH-1_042523	4/25/23	0920	6	X			2						2	Please provide results w QC
DUP-01_042523	4/25/23	—	6	X			2						2	along with EDD
Osborn-MH-1_SW_042523	4/25/23	0925	6	X			2						2	for all samples
~~Osborn-MH-1_SE_042523~~	dup042523													
~~Osborn-CB-2_042523~~	dup042523													

Turn Around Time Required (Prior lab approval required for expedited TAT.) X Standard ☐ Rush (Specify)	Sample Disposal ☐ Return to Client X Disposal by Lab	Possible Hazard Identification X Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)				
1. Relinquished by: Amyssa Mandich / Arcadis	Date: 4/25/23	Time: 1350	1. Received by: FedEx	Date: 4/25/23	Time: 1350		
2. Relinquished by	Date	Time	2. Received by	Date	Time		
3. Relinquished by	Date	Time	3. Received by	Date	Time		
4. Relinquished by: Fed Ex	Date: 4/26/23	Time: 1025	4. Laboratory received by: [illegible]	Date: 4/26/23	Time: 1025		
Note: All samples are retained for four weeks from receipt unless other arrangements are made.			LAB USE ONLY Received on ice (Circle): Yes No Ice Pack	Receipt Temp: 4.2 °C	Temp Blank: Y N		

2900

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MEG03N2-01

YD26014

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Number 145094

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 / marina.samp@arcadis.com	Quote No.
Address: 28550 Cabot Dr. Ste 300	Sampler's Signature: x Anyssa Mandich	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Novi / State: MI / Zip Code: 48377	Printed Name: Anyssa Mandich		
Project Name: RACER-Lansing PFAS Delineation			
Project No: 30171050.0370B	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-aqueous	No. of Containers by Preservative Type: Unpres.	HCl	HNO3	H2SO4	NaOH	5035 Vial	Field Filtered	EPA 537.1 M (PFAS) (MI List of 28)	Remarks / Cooler I.D.
~~Osboorn-MH-1_SW_042523~~	~~4/25/23~~	~~0925~~	~~G~~	~~X~~			~~2~~								
Osboorn-MH-1_SE_042523	4/25/23	0930	G	X			2							2	
Osboorn-CB-2_042523	4/25/23	0945	G	X			2							2	
P3-MH-284_042523	4/25/23	1015	G	X			2							2	
P2-MH-2_042523	4/25/23	1045	G	X			2							2	
P2-MH-W_042523	4/25/23	1120	G	X			2							2	
FB-01_042523	4/25/23	1148	G	X			2							2	
EB-01_042523	4/25/23	1145	G	X			2							2	

YD26014
KER2

Please provide results + QC along with EDD for all samples

Turn Around Time Required (Prior lab approval required for expedited TAT.)	Sample Disposal	Possible Hazard Identification	QC Requirements (Specify)		
X Standard ☐ Rush (Specify)	☐ Return to Client X Disposal by Lab	X Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown			
1. Relinquished by: Anyssa Mandich / Arcadis	Date: 4/25/23	Time: 1350	1. Received by: FedEx	Date: 4/25/23	Time: 1350
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fed Ex	Date: 4/26/23	Time: 1025	4. Laboratory received by: Hayley N Roberts	Date: 04/26/23	Time: 1025

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 4.2 °C — Temp Blank Y ☐ N

2.9°

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MEOG3N2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KNR / 04/26/2023 Lot #: YD26014

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.2 / 4.2 °C 2.9 / 2.9 °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25015

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Racer – Lansing Plant 2,3&6

Data Review

Lansing, Michigan

VOC Analyses

SDG # S48825, S48827 and S48828

VOCs Analyses Performed By:
Merit Laboratories Inc.
East Lansing, Michigan

Report #52347R
Review Level: Tier II
Project: 30171056.00603

Summary

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # S48825, S48827 and S48828 for samples collected in association with Plants 2, 3 & 6 in Lansing Michigan. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	1,4-D	PFAS	MET	MISC
S48825	MW-13-48	S48825-1	GW	05/19/23			X			
	MW-13-34	S48825-2	GW	05/19/23			X			
	MW-13-22	S48825-5	GW	05/19/23			X			
	MW-12-21	S48825-6	GW	05/19/23			X			
	AS-19-A07	S48825-7	GW	05/19/23			X			
	AS-19-A06	S48825-8	GW	05/19/23			X			
	DUP-05	S48825-9	GW	05/19/23	MW-12-21		X			
S48827	MW-21-141	S48827-1	GW	05/18/23			X			
S48828	MW-20-130	S48828-1	GW	05/18/23			X			
	MW-16-85	S48828-2	GW	05/18/23			X			

Note:

1. SDG (S48825) Sample MW-13-34 was used as the MS/MSD.
2. SDG (S48827) Sample MW-21-141 was used as the MS/MSD.

Analytical Data Package Documentation

The table below evaluates the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed chain-of-custody form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data package completeness and compliance		X		X	

Note:
QA = quality assurance

Organic Analysis Introduction

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines NFG for Organic Superfund Methods Data Review, EPA-540-R-20-005 (November 2020), with reference to the historical (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate) and the Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound is considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

The "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R"

values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Volatile Organic Compounds Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
8260B by SIM	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2 with hydrochloric acid

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the reporting limit (RL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. No other qualification of the sample results was required.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

For the SIM analysis, the samples were spiked with internal standards instead of surrogates. All internal standard recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations

where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSDs exhibited recoveries and RPDs within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

6. Field Duplicate Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate sample results for water matrices. For the case where the parent and/or duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/ Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
MW-12-21 / DUP-05	1,4-Dioxane	167	162	3.1%

Notes:
AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for VOCs

1,4-DIOXANE: SW-846 8260C and 8260B by SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks	X				X
C. Trip blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Internal Standard/Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE: 

DATE: December 19, 2023

PEER REVIEW: Joseph C. Houser

DATE: December 27, 2023

Chain of Custody Corrected Sample Analysis Data Sheets

PLANT-3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152807

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: KAITLYN HUNT
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR, SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO. 947-777-5215 CELL NO. —
P.O. NO. US346000080997
E-MAIL ADDRESS: KAITLYN.HUNT@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30171056.04708 / RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J COBERN

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIMS										Special Instructions
48825.01	5/19/23	845	MW-13-48_051923	GW	3		3						X										
.02/.03/.04	5/19/23	945	MW-13-34_051923	GW	9		9						X										MS/MSD
.05	5/19/23	1050	MW-13-22_051923	GW	3		3						X										
.06	5/19/23	1215	MW-12-21_051923	GW	3		3						X										
.07	5/19/23	1310	AS-19-A07_051923	GW	3		3						X										
.08	5/19/23	1420	AS-19-A06_051923	GW	3		3						X										
.09	5/19/23	—	DUP-05_051923	GW	3		3						X										

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler ARCADIS DATE 5.19.23 TIME 16:30
RECEIVED BY: SIGNATURE/ORGANIZATION Johanna Murray DATE 5/19/23 TIME 1630
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: JRM TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Lab Sample ID: S48825.01
Sample Tag: MW-13-48_051923
Collected Date/Time: 05/19/2023 08:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 04:59, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	62	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48825.02
Sample Tag: MW-13-34_051923
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 05:21, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	109	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.03
Sample Tag: MW-13-34_051923 MS
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 00:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	166	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S48825.04
Sample Tag: MW-13-34_051923 MSD
Collected Date/Time: 05/19/2023 09:45
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 01:03, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	173	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S48825.05
Sample Tag: MW-13-22_051923
Collected Date/Time: 05/19/2023 10:50
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 05:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	179	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48825.06
Sample Tag: MW-12-21_051923
Collected Date/Time: 05/19/2023 12:15
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 06:05, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	167	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.07
Sample Tag: AS-19-A07_051923
Collected Date/Time: 05/19/2023 13:10
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 18:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.08
Sample Tag: AS-19-A06_051923
Collected Date/Time: 05/19/2023 14:20
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 06:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S48825.09
Sample Tag: DUP-05_051923
Collected Date/Time: 05/19/2023 00:01
Matrix: Groundwater
COC Reference: 152807

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:10, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	162	1		ug/L	1	123-91-1	

Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

152320

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470A / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus W.C

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS	Special Instructions
.01/.02/.03	5/18/23	1225	MW-21-141_051823	GW	9		9						X		MS/MSD
48827.04															

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Austin Westhuis / Arcadis ☒ Sampler DATE: 5.18.23 TIME: 16:35
RECEIVED BY: SIGNATURE/ORGANIZATION: ARCADIS DATE: 5.18.23 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: ARCADIS DATE: 5-19-23 TIME: 16:30
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 5/19/23 TIME: 1530
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP ON ARRIVAL: JRM ~~0.0~~ 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Lab Sample ID: S48827.01
Sample Tag: MW-21-141_051823
Collected Date/Time: 05/18/2023 12:25
Matrix: Groundwater
COC Reference: 152320

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/25/23 10:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/25/23 19:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 152319

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 CELL NO.: P.O. NO.:
E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30171056.0470A / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B-SIMS	VOC 8260B-SIMS
48828.01	5/18/23	1005	MW-20-130_051823	GW	3		3						X	
.02	5/18/23	1630	MW-16-85_051823	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / Arcadis ☒ Sampler DATE: 5/18/23 TIME: 1635
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS DATE: 5-18-23 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / ARCADIS DATE: 5.19.23 TIME: 15:30
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Murray DATE: 5/19/23 TIME: 1530

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Analytical Laboratory Report

Lab Sample ID: S48828.01
Sample Tag: MW-20-130_051823
Collected Date/Time: 05/18/2023 10:05
Matrix: Groundwater
COC Reference: 152319

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S48828.02
Sample Tag: MW-16-85_051823
Collected Date/Time: 05/18/2023 16:30
Matrix: Groundwater
COC Reference: 152319

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	05/24/23 10:30	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 05/24/23 07:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Report ID: S52827.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S52827.01-S52827.12
Project: RACER Lansing GWS - 30171056.0470B
Collected Date(s): 08/30/2023
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.0470B

Table of Contents

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Report Narrative (Page 2)
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QC Report (Pages 18-51)



Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (12 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S52827.01	MW-13-34_083023	Groundwater	08/30/23 10:40
S52827.02	PW-14-03R_083023	Groundwater	08/30/23 11:55
S52827.03	MW-12-21_083023	Groundwater	08/30/23 12:50
S52827.04	MW-13-22_083023	Groundwater	08/30/23 13:55
S52827.05	MW-13-22_083023 MS	Groundwater	08/30/23 13:55
S52827.06	MW-13-22_083023 MSD	Groundwater	08/30/23 13:55
S52827.07	AS-19-A07_083023	Groundwater	08/30/23 10:35
S52827.08	AS-19-A06_083023	Groundwater	08/30/23 11:40
S52827.09	TW-15-11_083023	Groundwater	08/30/23 13:30
S52827.10	TW-14-06_083023	Groundwater	08/30/23 14:25
S52827.11	DUP-04_083023	Groundwater	08/30/23 00:01
S52827.12	Trip Blank	Water	08/30/23 00:01

Analytical Laboratory Report

Lab Sample ID: S52827.01
Sample Tag: MW-13-34_083023
Collected Date/Time: 08/30/2023 10:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	106	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.02
Sample Tag: PW-14-03R_083023
Collected Date/Time: 08/30/2023 11:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.03
Sample Tag: MW-12-21_083023
Collected Date/Time: 08/30/2023 12:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	199	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.04
Sample Tag: MW-13-22_083023
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 17:07, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	138	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.05
Sample Tag: MW-13-22_083023 MS
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 20:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	185	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S52827.06
Sample Tag: MW-13-22_083023 MSD
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 21:17, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	194	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S52827.07
Sample Tag: AS-19-A07_083023
Collected Date/Time: 08/30/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 17:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.08
Sample Tag: AS-19-A06_083023
Collected Date/Time: 08/30/2023 11:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 23:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.09
Sample Tag: TW-15-11_083023
Collected Date/Time: 08/30/2023 13:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	120	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.10
Sample Tag: TW-14-06_083023
Collected Date/Time: 08/30/2023 14:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.11
Sample Tag: DUP-04_083023
Collected Date/Time: 08/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.12
Sample Tag: Trip Blank
Collected Date/Time: 08/30/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Other / Misc.

Method: , Run Date: 09/07/23 11:45, Analyst: MMC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Quality Control Report

Report ID: S52827.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S52827.01-S52827.11
Project: RACER Lansing GWS - 30171056.0470B
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.0470B

QC Report Sections

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Analysis Summary (Pages 19-29)
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Surrogates per QC Sample (Page 40)
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Internal Standards per QC Sample (Page 50)
Batch QC Results (Page 51)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S52827.01
Sample Tag: MW-13-34_083023
Collected Date/Time: 08/30/2023 10:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 16:04	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.02

Sample Tag: PW-14-03R_083023

Collected Date/Time: 08/30/2023 11:55

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 16:25	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.03
Sample Tag: MW-12-21_083023
Collected Date/Time: 08/30/2023 12:50
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 16:46	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.04

Sample Tag: MW-13-22_083023

Collected Date/Time: 08/30/2023 13:55

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 17:07	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.05

Sample Tag: MW-13-22_083023 MS

Collected Date/Time: 08/30/2023 13:55

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 20:56	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.06

Sample Tag: MW-13-22_083023 MSD

Collected Date/Time: 08/30/2023 13:55

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 21:17	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.07

Sample Tag: AS-19-A07_083023

Collected Date/Time: 08/30/2023 10:35

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 17:28	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.08

Sample Tag: AS-19-A06_083023

Collected Date/Time: 08/30/2023 11:40

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 23:02	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.09

Sample Tag: TW-15-11_083023

Collected Date/Time: 08/30/2023 13:30

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 18:09	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.10

Sample Tag: TW-14-06_083023

Collected Date/Time: 08/30/2023 14:25

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 18:30	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52827.11

Sample Tag: DUP-04_083023

Collected Date/Time: 08/30/2023 00:01

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 18:51	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Organics - Volatiles, Prep Batch ID: VS230907W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52827.01	1,4-Dioxane	SW8260B - SIM	09/07/23 16:04	230907A9
S52827.02	1,4-Dioxane	SW8260B - SIM	09/07/23 16:25	230907A9
S52827.03	1,4-Dioxane	SW8260B - SIM	09/07/23 16:46	230907A9
S52827.04	1,4-Dioxane	SW8260B - SIM	09/07/23 17:07	230907A9
S52827.05	1,4-Dioxane	SW8260B - SIM	09/07/23 20:56	230907A9
S52827.06	1,4-Dioxane	SW8260B - SIM	09/07/23 21:17	230907A9
S52827.07	1,4-Dioxane	SW8260B - SIM	09/07/23 17:28	230907A9
S52827.08	1,4-Dioxane	SW8260B - SIM	09/07/23 23:02	230907A9
S52827.09	1,4-Dioxane	SW8260B - SIM	09/07/23 18:09	230907A9
S52827.10	1,4-Dioxane	SW8260B - SIM	09/07/23 18:30	230907A9
S52827.11	1,4-Dioxane	SW8260B - SIM	09/07/23 18:51	230907A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.01

Sample Tag: MW-13-34_083023

Collected Date/Time: 08/30/2023 10:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:04, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**92.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.02

Sample Tag: PW-14-03R_083023

Collected Date/Time: 08/30/2023 11:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:25, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.03

Sample Tag: MW-12-21_083023

Collected Date/Time: 08/30/2023 12:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:46, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**100.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.04

Sample Tag: MW-13-22_083023

Collected Date/Time: 08/30/2023 13:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 17:07, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**100.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.07

Sample Tag: AS-19-A07_083023

Collected Date/Time: 08/30/2023 10:35

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 17:28, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**100.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.08

Sample Tag: AS-19-A06_083023

Collected Date/Time: 08/30/2023 11:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 23:02, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**100.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.09

Sample Tag: TW-15-11_083023

Collected Date/Time: 08/30/2023 13:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.10

Sample Tag: TW-14-06_083023

Collected Date/Time: 08/30/2023 14:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:30, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52827.11

Sample Tag: DUP-04_083023

Collected Date/Time: 08/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:51, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**95.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.01

Sample Tag: MW-13-34_083023

Collected Date/Time: 08/30/2023 10:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**107.9**	50.0	200.0
1,4-Dioxane-D8		**93.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**101.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.02

Sample Tag: PW-14-03R_083023

Collected Date/Time: 08/30/2023 11:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**106.1**	50.0	200.0
1,4-Dioxane-D8		**104.3**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**98.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.03

Sample Tag: MW-12-21_083023

Collected Date/Time: 08/30/2023 12:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 16:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**103.6**	50.0	200.0
1,4-Dioxane-D8		**88.6**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**96.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.04

Sample Tag: MW-13-22_083023

Collected Date/Time: 08/30/2023 13:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 17:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**104.8**	50.0	200.0
1,4-Dioxane-D8		**100.5**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**98.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.07

Sample Tag: AS-19-A07_083023

Collected Date/Time: 08/30/2023 10:35

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 17:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**105.8**	50.0	200.0
1,4-Dioxane-D8		**116.6**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**99.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.08

Sample Tag: AS-19-A06_083023

Collected Date/Time: 08/30/2023 11:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 23:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**98.0**	50.0	200.0
1,4-Dioxane-D8		**103.3**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**92.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.09

Sample Tag: TW-15-11_083023

Collected Date/Time: 08/30/2023 13:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**107.1**	50.0	200.0
1,4-Dioxane-D8		**101.5**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**100.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.10

Sample Tag: TW-14-06_083023

Collected Date/Time: 08/30/2023 14:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**108.1**	50.0	200.0
1,4-Dioxane-D8		**99.1**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**97.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52827.11

Sample Tag: DUP-04_083023

Collected Date/Time: 08/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 18:51, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**108.4**	50.0	200.0
1,4-Dioxane-D8		**100.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**97.3**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**99.8**	50.0	200.0
1,4-Dioxane-D8		**104.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**94.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**100.0**	50.0	200.0
1,4-Dioxane-D8		**100.0**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**100.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**87.9**	50.0	200.0
1,4-Dioxane-D8		**95.3**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**91.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**102.4**	50.0	200.0
1,4-Dioxane-D8		**96.8**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**93.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**102.5**	50.0	200.0
1,4-Dioxane-D8		**93.2**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**92.4**	50.0	200.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VS230907W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.46	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		103.4	70.0	130.0	1.8	30.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.5	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		113.1	70.0	130.0	4.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S52827
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing GWS - 30171056.0470B
Submitted: 08/30/2023 16:05 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 11.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF _____

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO. | P.O. NO.
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.0470B | SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☒ Other MI

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Special Instructions
52827.01	8/30/23	1040	MW-13-34_083023	GW	3		3						3		
.02	8/30/23	1155	PW-14-03R_083023	GW	3		3						3		
.03	8/30/23	1250	MW-12-21_083023	GW	3		3						3		
.04/.05/.06	8/30/23	1355	MW-13-22_083023	GW	9		9						9		MS/MSD
.07	8/30/23	1035	AS-19-07_083023	GW	3		3						3		
.08	8/30/23	1140	AS-19-06_083023	GW	3		3						3		
.09	8/30/23	1330	TW-15-11_083023	GW	3		3						3		
.10	8/30/23	14:25	TW-14-06_083023	GW	3		3						3		
.11	8/30/23	—	DUP-04_083023	GW	3		3						3		
.12															

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Austin Westhuis (Sampler)	DATE 8/30/23	TIME 1605
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 8/30/23	TIME 1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S52828.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S52828.01-S52828.07
Project: RACER Lansing GWS - 30171056.00102 Plant 6
Collected Date(s): 08/29/2023
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.00102

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S52828.01	MW-22-154_082923	Groundwater	08/29/23 11:00
S52828.02	MW-20-131_082923	Groundwater	08/29/23 12:25
S52828.03	MW-20-132_082923	Groundwater	08/29/23 13:20
S52828.04	MW-20-132_082923 MS	Groundwater	08/29/23 13:20
S52828.05	MW-20-132_082923 MSD	Groundwater	08/29/23 13:20
S52828.06	DUP-03_082923	Groundwater	08/29/23 00:01
S52828.07	Trip Blank	Water	08/29/23 00:01

Lab Sample ID: S52828.01
Sample Tag: MW-22-154_082923
Collected Date/Time: 08/29/2023 11:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/11/23 11:45	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:19, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.01 (continued)
Sample Tag: MW-22-154_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:19, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.02
Sample Tag: MW-20-131_082923
Collected Date/Time: 08/29/2023 12:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/11/23 11:45	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:43, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	2	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.02 (continued)
Sample Tag: MW-20-131_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:43, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.03
Sample Tag: MW-20-132_082923
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 21:09, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	7	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.03 (continued)
Sample Tag: MW-20-132_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 21:09, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.04
Sample Tag: MW-20-132_082923 MS
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	59	10		ug/L	1	60-29-7	1
Acetone	Not detected	50		ug/L	1	67-64-1	1
Methyl iodide	57	1		ug/L	1	74-88-4	1
Carbon disulfide	49	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	54	5		ug/L	1	1634-04-4	1
Acrylonitrile	50	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	45	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	40	5		ug/L	1	75-71-8	1
Chloromethane	46	5		ug/L	1	74-87-3	1
Vinyl chloride	47	1		ug/L	1	75-01-4	1
Bromomethane	49	5		ug/L	1	74-83-9	1
Chloroethane	46	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	43	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	46	1		ug/L	1	75-35-4	1
Methylene chloride	56	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	48	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	51	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	61	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	52	1		ug/L	1	67-66-3	1
Bromochloromethane	58	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	47	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Carbon tetrachloride	47	1		ug/L	1	56-23-5	1
Benzene	51	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	48	1		ug/L	1	107-06-2	1
Trichloroethene	50	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	53	1		ug/L	1	78-87-5	1
Bromodichloromethane	54	1		ug/L	1	75-27-4	1
Dibromomethane	60	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	57	1		ug/L	1	10061-01-5	1
Toluene	50	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	56	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	54	1		ug/L	1	79-00-5	1
Tetrachloroethene	50	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.04 (continued)
Sample Tag: MW-20-132_082923 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:04, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	45	1		ug/L	1	110-57-6	1
Dibromochloromethane	61	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	57	1		ug/L	1	106-93-4	1
Chlorobenzene	56	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	60	1		ug/L	1	630-20-6	1
Ethylbenzene	52	1		ug/L	1	100-41-4	1
p,m-Xylene*	105	2		ug/L	1		1
o-Xylene	53	1		ug/L	1	95-47-6	1
Styrene	56	1		ug/L	1	100-42-5	1
Isopropylbenzene	50	5		ug/L	1	98-82-8	1
Bromoform	59	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	53	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	53	1		ug/L	1	96-18-4	1
n-Propylbenzene	50	1		ug/L	1	103-65-1	1
Bromobenzene	60	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	53	1		ug/L	1	108-67-8	1
tert-Butylbenzene	48	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	53	1		ug/L	1	95-63-6	1
sec-Butylbenzene	46	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	47	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	52	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	53	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	53	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	49	1		ug/L	1	526-73-8	1
n-Butylbenzene	45	1		ug/L	1	104-51-8	1
Hexachloroethane	51	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	52	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	55	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	55	5		ug/L	1	87-61-6	1
Naphthalene	49	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	47	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.05
Sample Tag: MW-20-132_082923 MSD
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:28, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	49	10		ug/L	1	60-29-7	1
Acetone	Not detected	50		ug/L	1	67-64-1	1
Methyl iodide	48	1		ug/L	1	74-88-4	1
Carbon disulfide	42	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	44	5		ug/L	1	1634-04-4	1
Acrylonitrile	42	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	39	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	36	5		ug/L	1	75-71-8	1
Chloromethane	40	5		ug/L	1	74-87-3	1
Vinyl chloride	41	1		ug/L	1	75-01-4	1
Bromomethane	41	5		ug/L	1	74-83-9	1
Chloroethane	39	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	36	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	40	1		ug/L	1	75-35-4	1
Methylene chloride	45	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	41	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	42	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	51	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	43	1		ug/L	1	67-66-3	1
Bromochloromethane	47	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	40	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Carbon tetrachloride	42	1		ug/L	1	56-23-5	1
Benzene	44	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	40	1		ug/L	1	107-06-2	1
Trichloroethene	44	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	44	1		ug/L	1	78-87-5	1
Bromodichloromethane	44	1		ug/L	1	75-27-4	1
Dibromomethane	51	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	46	1		ug/L	1	10061-01-5	1
Toluene	43	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	46	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	44	1		ug/L	1	79-00-5	1
Tetrachloroethene	44	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.05 (continued)
Sample Tag: MW-20-132_082923 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:28, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	41	1		ug/L	1	110-57-6	1
Dibromochloromethane	52	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	49	1		ug/L	1	106-93-4	1
Chlorobenzene	49	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	51	1		ug/L	1	630-20-6	1
Ethylbenzene	47	1		ug/L	1	100-41-4	1
p,m-Xylene*	93	2		ug/L	1		1
o-Xylene	47	1		ug/L	1	95-47-6	1
Styrene	49	1		ug/L	1	100-42-5	1
Isopropylbenzene	46	5		ug/L	1	98-82-8	1
Bromoform	51	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	47	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	46	1		ug/L	1	96-18-4	1
n-Propylbenzene	46	1		ug/L	1	103-65-1	1
Bromobenzene	52	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	48	1		ug/L	1	108-67-8	1
tert-Butylbenzene	44	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	48	1		ug/L	1	95-63-6	1
sec-Butylbenzene	43	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	44	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	47	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	48	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	48	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	45	1		ug/L	1	526-73-8	1
n-Butylbenzene	43	1		ug/L	1	104-51-8	1
Hexachloroethane	47	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	48	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	51	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	51	5		ug/L	1	87-61-6	1
Naphthalene	48	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	47	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.06
Sample Tag: DUP-03_082923
Collected Date/Time: 08/29/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:26	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 19:57, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.06 (continued)

Sample Tag: DUP-03_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 19:57, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.07
Sample Tag: Trip Blank
Collected Date/Time: 08/29/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:26	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 16:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.07 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 16:01, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S52828.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S52828.01-S52828.07
Project: RACER Lansing GWS - 30171056.00102 Plant 6
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.00102

QC Report Sections

Cover Page (Page 20)
Analysis Summary (Pages 21-27)
Prep Batch Summary (Page 28)
Surrogates per Lab Sample (Pages 29-33)
Surrogates per QC Sample (Pages 34-36)
Internal Standards per Lab Sample (Pages 37-41)
Internal Standards per QC Sample (Pages 42-44)
Batch QC Results (Pages 45-62)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S52828.01
Sample Tag: MW-22-154_082923
Collected Date/Time: 08/29/2023 11:00
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/09/23 05:19	230908B7	VF230908W4	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S52828.02
Sample Tag: MW-20-131_082923
Collected Date/Time: 08/29/2023 12:25
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/09/23 05:43	230908B7	VF230908W4	Yes	BLK/LCS/LCSD

Lab Sample ID: S52828.03
Sample Tag: MW-20-132_082923
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 21:09	230901A7	VF230901W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52828.04

Sample Tag: MW-20-132_082923 MS

Collected Date/Time: 08/29/2023 13:20

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 14:04	230901A7	VF230901W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52828.05

Sample Tag: MW-20-132_082923 MSD

Collected Date/Time: 08/29/2023 13:20

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 14:28	230901A7	VF230901W2	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S52828.06
Sample Tag: DUP-03_082923
Collected Date/Time: 08/29/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 19:57	230907A7	VF230907W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S52828.07

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 16:01	230907A7	VF230907W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230901W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52828.03	Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 21:09	230901A7
S52828.04	Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 14:04	230901A7
S52828.05	Volatile Organics - DEQ List	SW5030C/8260C	09/01/23 14:28	230901A7

Organics - Volatiles, Prep Batch ID: VF230907W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52828.06	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 19:57	230907A7
S52828.07	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 16:01	230907A7

Organics - Volatiles, Prep Batch ID: VF230908W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52828.01	Volatile Organics - DEQ List	SW5030C/8260C	09/09/23 05:19	230908B7
S52828.02	Volatile Organics - DEQ List	SW5030C/8260C	09/09/23 05:43	230908B7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52828.01

Sample Tag: MW-22-154_082923

Collected Date/Time: 08/29/2023 11:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230908B7, Run Date: 09/09/2023 05:19, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**117.2**	80.0	124.0
1,2-Dichloroethane-D4		**81.7**	72.0	125.0
Toluene-D8		**93.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52828.02

Sample Tag: MW-20-131_082923

Collected Date/Time: 08/29/2023 12:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230908B7, Run Date: 09/09/2023 05:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**117.4**	80.0	124.0
1,2-Dichloroethane-D4		**85.2**	72.0	125.0
Toluene-D8		**94.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52828.03

Sample Tag: MW-20-132_082923

Collected Date/Time: 08/29/2023 13:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230901A7, Run Date: 09/01/2023 21:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**108.8**	80.0	124.0
1,2-Dichloroethane-D4		**92.6**	72.0	125.0
Toluene-D8		**95.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52828.06

Sample Tag: DUP-03_082923

Collected Date/Time: 08/29/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230907A7, Run Date: 09/07/2023 19:57, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**112.1**	80.0	124.0
1,2-Dichloroethane-D4		**83.4**	72.0	125.0
Toluene-D8		**93.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52828.07

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230907A7, Run Date: 09/07/2023 16:01, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**112.3**	80.0	124.0
1,2-Dichloroethane-D4		**79.3**	72.0	125.0
Toluene-D8		**93.0**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF230901W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230901A7.BLKW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 15:39, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**105.1**	80.0	124.0
1,2-Dichloroethane-D4		**87.2**	72.0	125.0
Toluene-D8		**94.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:06, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.6**	80.0	124.0
1,2-Dichloroethane-D4		**84.2**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230901A7.LCSDW01A, Parent Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:30, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**112.8**	80.0	124.0
1,2-Dichloroethane-D4		**92.0**	72.0	125.0
Toluene-D8		**94.1**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 230901A7.5282804M, Parent Sample ID: S52828.03

Run in Batch: 230901A7, Run Date: 09/01/2023 14:04, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**110.9**	80.0	124.0
1,2-Dichloroethane-D4		**87.7**	72.0	125.0
Toluene-D8		**94.0**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230901A7.5282805N, Parent Sample ID: 230901A7.5282804M

Run in Batch: 230901A7, Run Date: 09/01/2023 14:28, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.3**	80.0	124.0
1,2-Dichloroethane-D4		**80.6**	72.0	125.0
Toluene-D8		**93.6**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF230907W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230907A7.BLKW07A

Run in Batch: 230907A7, Run Date: 09/07/2023 14:03, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**112.8**	80.0	124.0
1,2-Dichloroethane-D4		**87.8**	72.0	125.0
Toluene-D8		**94.9**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:29, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**114.9**	80.0	124.0
1,2-Dichloroethane-D4		**80.0**	72.0	125.0
Toluene-D8		**93.5**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A7.LCSDS07A, Parent Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**116.7**	80.0	124.0
1,2-Dichloroethane-D4		**79.0**	72.0	125.0
Toluene-D8		**92.4**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF230908W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230908B7.BLKW08B

Run in Batch: 230908B7, Run Date: 09/09/2023 00:12, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**115.4**	80.0	124.0
1,2-Dichloroethane-D4		**79.6**	72.0	125.0
Toluene-D8		**92.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 22:38, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**118.4**	80.0	124.0
1,2-Dichloroethane-D4		**76.4**	72.0	125.0
Toluene-D8		**92.9**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908B7.LCSDW08B, Parent Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 23:01, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**117.6**	80.0	124.0
1,2-Dichloroethane-D4		**75.6**	72.0	125.0
Toluene-D8		**92.8**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52828.01

Sample Tag: MW-22-154_082923

Collected Date/Time: 08/29/2023 11:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230908B7, Run Date: 09/09/2023 05:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**116.1**	50.0	200.0
1,4-Difluorobenzene		**119.2**	50.0	200.0
Chlorobenzene-D5		**119.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**118.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52828.02

Sample Tag: MW-20-131_082923

Collected Date/Time: 08/29/2023 12:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230908B7, Run Date: 09/09/2023 05:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**124.3**	50.0	200.0
1,4-Difluorobenzene		**129.4**	50.0	200.0
Chlorobenzene-D5		**134.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**133.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52828.03

Sample Tag: MW-20-132_082923

Collected Date/Time: 08/29/2023 13:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230901A7, Run Date: 09/01/2023 21:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**103.4**	50.0	200.0
1,4-Difluorobenzene		**105.2**	50.0	200.0
Chlorobenzene-D5		**105.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52828.06

Sample Tag: DUP-03_082923

Collected Date/Time: 08/29/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230907A7, Run Date: 09/07/2023 19:57, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**97.9**	50.0	200.0
1,4-Difluorobenzene		**100.1**	50.0	200.0
Chlorobenzene-D5		**100.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52828.07

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230907A7, Run Date: 09/07/2023 16:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**97.8**	50.0	200.0
1,4-Difluorobenzene		**97.5**	50.0	200.0
Chlorobenzene-D5		**95.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230901W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230901A7.BLKW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 15:39, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.2**	50.0	200.0
1,4-Difluorobenzene		**99.9**	50.0	200.0
Chlorobenzene-D5		**99.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.1**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:06, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**105.9**	50.0	200.0
1,4-Difluorobenzene		**103.3**	50.0	200.0
Chlorobenzene-D5		**101.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230901A7.LCSDW01A, Parent Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:30, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**110.8**	50.0	200.0
1,4-Difluorobenzene		**110.8**	50.0	200.0
Chlorobenzene-D5		**108.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**109.7**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230901A7.5282804M, Parent Sample ID: S52828.03

Run in Batch: 230901A7, Run Date: 09/01/2023 14:04, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**110.1**	50.0	200.0
1,4-Difluorobenzene		**109.7**	50.0	200.0
Chlorobenzene-D5		**109.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**108.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230901A7.5282805N, Parent Sample ID: 230901A7.5282804M

Run in Batch: 230901A7, Run Date: 09/01/2023 14:28, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**106.7**	50.0	200.0
1,4-Difluorobenzene		**103.5**	50.0	200.0
Chlorobenzene-D5		**99.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230907W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230907A7.BLKW07A

Run in Batch: 230907A7, Run Date: 09/07/2023 14:03, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**103.0**	50.0	200.0
1,4-Difluorobenzene		**106.2**	50.0	200.0
Chlorobenzene-D5		**110.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**107.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:29, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**103.7**	50.0	200.0
1,4-Difluorobenzene		**104.1**	50.0	200.0
Chlorobenzene-D5		**103.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A7.LCSDS07A, Parent Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**101.5**	50.0	200.0
1,4-Difluorobenzene		**101.5**	50.0	200.0
Chlorobenzene-D5		**99.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.1**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230908W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230908B7.BLKW08B

Run in Batch: 230908B7, Run Date: 09/09/2023 00:12, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.8**	50.0	200.0
1,4-Difluorobenzene		**94.6**	50.0	200.0
Chlorobenzene-D5		**95.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 22:38, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.0**	50.0	200.0
1,4-Difluorobenzene		**100.0**	50.0	200.0
Chlorobenzene-D5		**100.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908B7.LCSDW08B, Parent Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 23:01, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.3**	50.0	200.0
1,4-Difluorobenzene		**97.8**	50.0	200.0
Chlorobenzene-D5		**97.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230901W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230901A7.BLKW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 15:39, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 230901A7.BLKW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 15:39, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:06, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		108.6	67.4	121.2
Acetone		101.9	29.9	161.5
Methyl iodide		108.9	68.8	116.4
Carbon disulfide		98.2	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.9	73.2	122.4
Acrylonitrile		101.6	69.9	128.9
2-Butanone (MEK)		98.3	44.0	134.4
Dichlorodifluoromethane		92.5	10.0	222.8
Chloromethane		90.6	23.8	166.5
Vinyl chloride		92.7	43.5	149.1
Bromomethane		92.3	56.8	151.3
Chloroethane		89.6	53.4	149.4
Trichlorofluoromethane		86.0	59.7	151.8
1,1-Dichloroethene		94.3	69.6	139.4
Methylene chloride		101.8	73.3	121.1
trans-1,2-Dichloroethene		92.4	73.6	129.3
1,1-Dichloroethane		96.0	71.5	126.2
cis-1,2-Dichloroethene		100.9	76.6	122.1
Tetrahydrofuran		95.5	59.0	117.9
Chloroform		95.6	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:06, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		106.2	78.2	120.8
1,1,1-Trichloroethane		92.0	79.4	130.9
4-Methyl-2-pentanone (MIBK)		102.9	71.6	125.2
2-Hexanone		104.0	55.4	136.9
Carbon tetrachloride		96.4	72.6	133.0
Benzene		96.4	79.9	124.9
1,2-Dichloroethane		88.2	76.0	126.3
Trichloroethene		98.1	79.7	124.2
1,2-Dichloropropane		97.6	78.6	126.4
Bromodichloromethane		99.6	80.4	128.2
Dibromomethane		111.5	76.9	122.1
cis-1,3-Dichloropropene		103.2	79.8	129.9
Toluene		96.8	79.8	124.5
trans-1,3-Dichloropropene		102.5	74.0	131.3
1,1,2-Trichloroethane		100.6	78.7	123.1
Tetrachloroethene		100.9	74.5	124.5
trans-1,4-Dichloro-2-butene		97.6	68.6	135.4
Dibromochloromethane		114.6	74.6	127.2
1,2-Dibromoethane		109.7	70.3	133.7
Chlorobenzene		106.2	79.2	122.7
1,1,1,2-Tetrachloroethane		111.4	80.3	128.2
Ethylbenzene		103.4	79.5	129.1
p,m-Xylene		104.6	79.4	132.2
o-Xylene		102.2	80.2	131.0
Styrene		106.7	69.5	126.7
Isopropylbenzene		104.0	74.4	121.5
Bromoform		115.3	69.4	128.0
1,1,2,2-Tetrachloroethane		108.2	79.8	126.3
1,2,3-Trichloropropane		109.4	78.3	138.8
n-Propylbenzene		103.0	82.0	130.7
Bromobenzene		112.4	78.7	124.6
1,3,5-Trimethylbenzene		107.9	81.3	128.9
tert-Butylbenzene		97.6	80.7	128.9
1,2,4-Trimethylbenzene		105.9	81.4	130.8
sec-Butylbenzene		97.4	77.4	129.8
p-Isopropyltoluene		98.3	79.8	137.5
1,3-Dichlorobenzene		102.5	77.0	131.3
1,4-Dichlorobenzene		103.1	20.7	137.7
1,2-Dichlorobenzene		102.6	10.0	166.2
1,2,3-Trimethylbenzene		97.4	76.3	124.2
n-Butylbenzene		98.1	80.0	133.3
Hexachloroethane		102.0	23.8	138.1
1,2-Dibromo-3-chloropropane		113.4	21.2	189.4
1,2,4-Trichlorobenzene		111.9	27.4	143.4
1,2,3-Trichlorobenzene		113.5	75.4	131.4
Naphthalene		108.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:06, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		107.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230901A7.LCSDW01A, Parent Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:30, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		114.6	67.4	121.2	5.4	30.0
Acetone		97.9	29.9	161.5	4.0	30.0
Methyl iodide		108.8	68.8	116.4	0.1	30.0
Carbon disulfide		93.4	63.8	137.4	5.0	30.0
tert-Methyl butyl ether (MTBE)		104.9	73.2	122.4	3.9	30.0
Acrylonitrile		101.1	69.9	128.9	0.5	30.0
2-Butanone (MEK)		93.8	44.0	134.4	4.6	30.0
Dichlorodifluoromethane		86.0	10.0	222.8	7.3	30.0
Chloromethane		89.0	23.8	166.5	1.8	30.0
Vinyl chloride		88.3	43.5	149.1	4.9	30.0
Bromomethane		88.6	56.8	151.3	4.1	30.0
Chloroethane		85.7	53.4	149.4	4.4	30.0
Trichlorofluoromethane		80.4	59.7	151.8	6.7	30.0
1,1-Dichloroethene		88.6	69.6	139.4	6.3	30.0
Methylene chloride		105.2	73.3	121.1	3.3	30.0
trans-1,2-Dichloroethene		90.2	73.6	129.3	2.4	30.0
1,1-Dichloroethane		94.1	71.5	126.2	2.1	30.0
cis-1,2-Dichloroethene		100.0	76.6	122.1	0.9	30.0
Tetrahydrofuran		84.6	59.0	117.9	12.1	30.0
Chloroform		96.2	78.4	124.0	0.6	30.0
Bromochloromethane		110.6	78.2	120.8	4.1	30.0
1,1,1-Trichloroethane		89.8	79.4	130.9	2.5	30.0
4-Methyl-2-pentanone (MIBK)		96.8	71.6	125.2	6.1	30.0
2-Hexanone		96.9	55.4	136.9	7.1	30.0
Carbon tetrachloride		90.3	72.6	133.0	6.5	30.0
Benzene		93.8	79.9	124.9	2.7	30.0
1,2-Dichloroethane		90.0	76.0	126.3	2.0	30.0
Trichloroethene		92.0	79.7	124.2	6.5	30.0
1,2-Dichloropropane		99.4	78.6	126.4	1.9	30.0
Bromodichloromethane		100.3	80.4	128.2	0.8	30.0
Dibromomethane		113.3	76.9	122.1	1.6	30.0
cis-1,3-Dichloropropene		105.5	79.8	129.9	2.2	30.0
Toluene		93.2	79.8	124.5	3.8	30.0
trans-1,3-Dichloropropene		105.4	74.0	131.3	2.7	30.0
1,1,2-Trichloroethane		101.6	78.7	123.1	1.0	30.0
Tetrachloroethene		95.3	74.5	124.5	5.7	30.0
trans-1,4-Dichloro-2-butene		95.1	68.6	135.4	2.6	30.0
Dibromochloromethane		118.3	74.6	127.2	3.2	30.0
1,2-Dibromoethane		111.4	70.3	133.7	1.5	30.0
Chlorobenzene		105.5	79.2	122.7	0.6	30.0

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230901A7.LCSDW01A, Parent Sample ID: 230901A7.LCSW01A

Run in Batch: 230901A7, Run Date: 09/01/2023 12:30, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		113.0	80.3	128.2	1.4	30.0
Ethylbenzene		99.4	79.5	129.1	4.0	30.0
p,m-Xylene		99.9	79.4	132.2	4.6	30.0
o-Xylene		99.7	80.2	131.0	2.5	30.0
Styrene		106.1	69.5	126.7	0.6	30.0
Isopropylbenzene		98.5	74.4	121.5	5.4	30.0
Bromoform		115.9	69.4	128.0	0.5	30.0
1,1,2,2-Tetrachloroethane		105.5	79.8	126.3	2.6	30.0
1,2,3-Trichloropropane		106.6	78.3	138.8	2.6	30.0
n-Propylbenzene		97.3	82.0	130.7	5.7	30.0
Bromobenzene		114.4	78.7	124.6	1.8	30.0
1,3,5-Trimethylbenzene		105.1	81.3	128.9	2.6	30.0
tert-Butylbenzene		93.3	80.7	128.9	4.5	30.0
1,2,4-Trimethylbenzene		104.2	81.4	130.8	1.6	30.0
sec-Butylbenzene		89.6	77.4	129.8	8.4	30.0
p-Isopropyltoluene		90.9	79.8	137.5	7.8	30.0
1,3-Dichlorobenzene		100.5	77.0	131.3	2.0	30.0
1,4-Dichlorobenzene		101.4	20.7	137.7	1.7	30.0
1,2-Dichlorobenzene		101.5	10.0	166.2	1.1	30.0
1,2,3-Trimethylbenzene		95.6	76.3	124.2	1.8	30.0
n-Butylbenzene		90.1	80.0	133.3	8.6	30.0
Hexachloroethane		97.5	23.8	138.1	4.5	30.0
1,2-Dibromo-3-chloropropane		106.2	21.2	189.4	6.6	30.0
1,2,4-Trichlorobenzene		113.1	27.4	143.4	1.0	30.0
1,2,3-Trichlorobenzene		114.3	75.4	131.4	0.7	30.0
Naphthalene		104.8	32.9	135.8	3.2	30.0
2-Methylnaphthalene		108.5	25.5	165.5	0.8	30.0

Matrix Spike (MS)

Lab Sample ID: 230901A7.5282804M, Parent Sample ID: S52828.03

Run in Batch: 230901A7, Run Date: 09/01/2023 14:04, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		117.8	67.4	121.2
Acetone		92.9	29.9	161.5
Methyl iodide		114.9	68.8	116.4
Carbon disulfide		96.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		108.8	73.2	122.4
Acrylonitrile		100.6	69.9	128.9
2-Butanone (MEK)		90.8	44.0	134.4
Dichlorodifluoromethane		80.6	10.0	222.8
Chloromethane		92.7	23.8	166.5
Vinyl chloride		94.1	43.5	149.1
Bromomethane		97.6	56.8	151.3
Chloroethane		93.0	53.4	149.4
Trichlorofluoromethane		75.9	59.7	151.8
1,1-Dichloroethene		92.6	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230901A7.5282804M, Parent Sample ID: S52828.03

Run in Batch: 230901A7, Run Date: 09/01/2023 14:04, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		111.7	73.3	121.1
trans-1,2-Dichloroethene		95.1	73.6	129.3
1,1-Dichloroethane		101.2	71.5	126.2
cis-1,2-Dichloroethene		106.9	76.6	122.1
Tetrahydrofuran		81.3	59.0	117.9
Chloroform		104.1	78.4	124.0
Bromochloromethane		116.9	78.2	120.8
1,1,1-Trichloroethane		93.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		93.9	71.6	125.2
2-Hexanone		92.8	55.4	136.9
Carbon tetrachloride		93.5	72.6	133.0
Benzene		101.6	79.9	124.9
1,2-Dichloroethane		95.4	76.0	126.3
Trichloroethene		99.1	79.7	124.2
1,2-Dichloropropane		105.5	78.6	126.4
Bromodichloromethane		107.4	80.4	128.2
Dibromomethane		119.1	76.9	122.1
cis-1,3-Dichloropropene		113.8	79.8	129.9
Toluene		99.8	79.8	124.5
trans-1,3-Dichloropropene		112.2	74.0	131.3
1,1,2-Trichloroethane		107.4	78.7	123.1
Tetrachloroethene		99.1	74.5	124.5
trans-1,4-Dichloro-2-butene		90.8	68.6	135.4
Dibromochloromethane		122.1	74.6	127.2
1,2-Dibromoethane		113.8	70.3	133.7
Chlorobenzene		112.2	79.2	122.7
1,1,1,2-Tetrachloroethane		120.9	80.3	128.2
Ethylbenzene		103.7	79.5	129.1
p,m-Xylene		105.3	79.4	132.2
o-Xylene		105.2	80.2	131.0
Styrene		112.1	69.5	126.7
Isopropylbenzene		101.0	74.4	121.5
Bromoform		118.4	69.4	128.0
1,1,2,2-Tetrachloroethane		105.1	79.8	126.3
1,2,3-Trichloropropane		104.9	78.3	138.8
n-Propylbenzene		99.6	82.0	130.7
Bromobenzene		119.7	78.7	124.6
1,3,5-Trimethylbenzene		105.3	81.3	128.9
tert-Butylbenzene		95.3	80.7	128.9
1,2,4-Trimethylbenzene		105.4	81.4	130.8
sec-Butylbenzene		91.1	77.4	129.8
p-Isopropyltoluene		93.2	79.8	137.5
1,3-Dichlorobenzene		104.7	77.0	131.3
1,4-Dichlorobenzene		106.0	20.7	137.7
1,2-Dichlorobenzene		106.6	10.0	166.2
1,2,3-Trimethylbenzene		98.9	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230901A7.5282804M, Parent Sample ID: S52828.03

Run in Batch: 230901A7, Run Date: 09/01/2023 14:04, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		90.7	80.0	133.3
Hexachloroethane		101.3	23.8	138.1
1,2-Dibromo-3-chloropropane		103.7	21.2	189.4
1,2,4-Trichlorobenzene		110.4	27.4	143.4
1,2,3-Trichlorobenzene		110.5	75.4	131.4
Naphthalene		98.8	32.9	135.8
2-Methylnaphthalene		93.8	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230901A7.5282805N, Parent Sample ID: 230901A7.5282804M

Run in Batch: 230901A7, Run Date: 09/01/2023 14:28, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		98.2	67.4	121.2	18.1	30.0
Acetone		82.4	29.9	161.5	11.7	30.0
Methyl iodide		97.0	68.8	116.4	16.9	30.0
Carbon disulfide		83.3	63.8	137.4	15.1	30.0
tert-Methyl butyl ether (MTBE)		88.4	73.2	122.4	20.7	30.0
Acrylonitrile		84.8	69.9	128.9	17.0	30.0
2-Butanone (MEK)		78.5	44.0	134.4	14.4	30.0
Dichlorodifluoromethane		71.7	10.0	222.8	11.8	30.0
Chloromethane		79.2	23.8	166.5	15.7	30.0
Vinyl chloride		81.1	43.5	149.1	14.8	30.0
Bromomethane		81.4	56.8	151.3	18.0	30.0
Chloroethane		78.2	53.4	149.4	17.2	30.0
Trichlorofluoromethane		85.2	59.7	151.8	11.5	30.0
1,1-Dichloroethene		79.5	69.6	139.4	15.2	30.0
Methylene chloride		90.2	73.3	121.1	21.4	30.0
trans-1,2-Dichloroethene		80.4	73.6	129.3	16.5	30.0
1,1-Dichloroethane		84.1	71.5	126.2	18.4	30.0
cis-1,2-Dichloroethene		87.7	76.6	122.1	17.2	30.0
Tetrahydrofuran		67.5	59.0	117.9	18.3	30.0
Chloroform		85.0	78.4	124.0	20.2	30.0
Bromochloromethane		94.6	78.2	120.8	21.1	30.0
1,1,1-Trichloroethane		79.6	79.4	130.9	16.4	30.0
4-Methyl-2-pentanone (MIBK)		79.7	71.6	125.2	16.3	30.0
2-Hexanone		81.1	55.4	136.9	13.5	30.0
Carbon tetrachloride		83.3	72.6	133.0	11.5	30.0
Benzene		86.9	79.9	124.9	15.6	30.0
1,2-Dichloroethane		79.1	76.0	126.3	18.7	30.0
Trichloroethene		86.4	79.7	124.2	13.5	30.0
1,2-Dichloropropane		87.7	78.6	126.4	18.4	30.0
Bromodichloromethane		88.6	80.4	128.2	19.1	30.0
Dibromomethane		101.0	76.9	122.1	16.4	30.0
cis-1,3-Dichloropropene		91.8	79.8	129.9	21.4	30.0
Toluene		85.7	79.8	124.5	15.2	30.0
trans-1,3-Dichloropropene		92.2	74.0	131.3	19.5	30.0

Organics - Volatiles, Prep Batch ID: VF230901W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 230901A7.5282805N, Parent Sample ID: 230901A7.5282804M

Run in Batch: 230901A7, Run Date: 09/01/2023 14:28, Prep Date: 09/01/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		88.9	78.7	123.1	18.8	30.0
Tetrachloroethene		88.0	74.5	124.5	11.8	30.0
trans-1,4-Dichloro-2-butene		81.2	68.6	135.4	11.1	30.0
Dibromochloromethane		104.8	74.6	127.2	15.3	30.0
1,2-Dibromoethane		98.5	70.3	133.7	14.4	30.0
Chlorobenzene		97.7	79.2	122.7	13.8	30.0
1,1,1,2-Tetrachloroethane		102.9	80.3	128.2	16.1	30.0
Ethylbenzene		93.3	79.5	129.1	10.6	30.0
p,m-Xylene		93.4	79.4	132.2	11.9	30.0
o-Xylene		93.4	80.2	131.0	11.9	30.0
Styrene		97.2	69.5	126.7	14.3	30.0
Isopropylbenzene		91.6	74.4	121.5	9.8	30.0
Bromoform		102.5	69.4	128.0	14.4	30.0
1,1,2,2-Tetrachloroethane		94.0	79.8	126.3	11.1	30.0
1,2,3-Trichloropropane		92.1	78.3	138.8	13.0	30.0
n-Propylbenzene		91.2	82.0	130.7	8.7	30.0
Bromobenzene		104.1	78.7	124.6	14.0	30.0
1,3,5-Trimethylbenzene		96.1	81.3	128.9	9.2	30.0
tert-Butylbenzene		87.6	80.7	128.9	8.4	30.0
1,2,4-Trimethylbenzene		95.5	81.4	130.8	9.9	30.0
sec-Butylbenzene		86.0	77.4	129.8	5.8	30.0
p-Isopropyltoluene		88.0	79.8	137.5	5.7	30.0
1,3-Dichlorobenzene		94.0	77.0	131.3	10.7	30.0
1,4-Dichlorobenzene		95.7	20.7	137.7	10.2	30.0
1,2-Dichlorobenzene		95.4	10.0	166.2	11.2	30.0
1,2,3-Trimethylbenzene		89.6	76.3	124.2	9.8	30.0
n-Butylbenzene		86.1	80.0	133.3	5.2	30.0
Hexachloroethane		93.9	23.8	138.1	7.5	30.0
1,2-Dibromo-3-chloropropane		96.9	21.2	189.4	6.8	30.0
1,2,4-Trichlorobenzene		102.3	27.4	143.4	7.6	30.0
1,2,3-Trichlorobenzene		102.5	75.4	131.4	7.6	30.0
Naphthalene		95.3	32.9	135.8	3.6	30.0
2-Methylnaphthalene		93.6	25.5	165.5	0.2	30.0

Organics - Volatiles, Prep Batch ID: VF230907W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230907A7.BLKW07A

Run in Batch: 230907A7, Run Date: 09/07/2023 14:03, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230907W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230907A7.BLKW07A

Run in Batch: 230907A7, Run Date: 09/07/2023 14:03, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:29, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		112.0	67.4	121.2
Acetone		105.2	29.9	161.5
Methyl iodide	*	116.8	68.8	116.4
Carbon disulfide		108.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		102.9	73.2	122.4
Acrylonitrile		107.1	69.9	128.9
2-Butanone (MEK)		98.5	44.0	134.4
Dichlorodifluoromethane		92.8	10.0	222.8
Chloromethane		96.6	23.8	166.5
Vinyl chloride		98.2	43.5	149.1
Bromomethane		97.3	56.8	151.3
Chloroethane		94.4	53.4	149.4
Trichlorofluoromethane		91.2	59.7	151.8
1,1-Dichloroethene		99.7	69.6	139.4
Methylene chloride		106.1	73.3	121.1
trans-1,2-Dichloroethene		97.8	73.6	129.3
1,1-Dichloroethane		100.6	71.5	126.2
cis-1,2-Dichloroethene		104.1	76.6	122.1
Tetrahydrofuran		93.8	59.0	117.9
Chloroform		98.7	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230907W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:29, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		109.2	78.2	120.8
1,1,1-Trichloroethane		96.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.9	71.6	125.2
2-Hexanone		101.3	55.4	136.9
Carbon tetrachloride		101.0	72.6	133.0
Benzene		101.6	79.9	124.9
1,2-Dichloroethane		88.3	76.0	126.3
Trichloroethene		101.9	79.7	124.2
1,2-Dichloropropane		101.2	78.6	126.4
Bromodichloromethane		100.3	80.4	128.2
Dibromomethane		115.4	76.9	122.1
cis-1,3-Dichloropropene		106.4	79.8	129.9
Toluene		99.7	79.8	124.5
trans-1,3-Dichloropropene		105.0	74.0	131.3
1,1,2-Trichloroethane		102.4	78.7	123.1
Tetrachloroethene		106.9	74.5	124.5
trans-1,4-Dichloro-2-butene		94.7	68.6	135.4
Dibromochloromethane		114.3	74.6	127.2
1,2-Dibromoethane		109.7	70.3	133.7
Chlorobenzene		106.7	79.2	122.7
1,1,1,2-Tetrachloroethane		113.0	80.3	128.2
Ethylbenzene		104.7	79.5	129.1
p,m-Xylene		105.2	79.4	132.2
o-Xylene		103.7	80.2	131.0
Styrene		107.9	69.5	126.7
Isopropylbenzene		105.9	74.4	121.5
Bromoform		117.6	69.4	128.0
1,1,2,2-Tetrachloroethane		108.1	79.8	126.3
1,2,3-Trichloropropane		107.7	78.3	138.8
n-Propylbenzene		105.7	82.0	130.7
Bromobenzene		113.2	78.7	124.6
1,3,5-Trimethylbenzene		108.8	81.3	128.9
tert-Butylbenzene		100.1	80.7	128.9
1,2,4-Trimethylbenzene		108.0	81.4	130.8
sec-Butylbenzene		98.1	77.4	129.8
p-Isopropyltoluene		98.3	79.8	137.5
1,3-Dichlorobenzene		100.5	77.0	131.3
1,4-Dichlorobenzene		101.5	20.7	137.7
1,2-Dichlorobenzene		102.1	10.0	166.2
1,2,3-Trimethylbenzene		96.7	76.3	124.2
n-Butylbenzene		98.5	80.0	133.3
Hexachloroethane		107.3	23.8	138.1
1,2-Dibromo-3-chloropropane		113.6	21.2	189.4
1,2,4-Trichlorobenzene		115.1	27.4	143.4
1,2,3-Trichlorobenzene		115.0	75.4	131.4
Naphthalene		106.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230907W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:29, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		103.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A7.LCSDS07A, Parent Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		105.8	67.4	121.2	5.7	30.0
Acetone		97.3	29.9	161.5	7.9	30.0
Methyl iodide		108.5	68.8	116.4	7.4	30.0
Carbon disulfide		99.4	63.8	137.4	8.6	30.0
tert-Methyl butyl ether (MTBE)		96.8	73.2	122.4	6.0	30.0
Acrylonitrile		97.8	69.9	128.9	9.1	30.0
2-Butanone (MEK)		89.0	44.0	134.4	10.2	30.0
Dichlorodifluoromethane		83.8	10.0	222.8	10.2	30.0
Chloromethane		86.9	23.8	166.5	10.6	30.0
Vinyl chloride		90.3	43.5	149.1	8.4	30.0
Bromomethane		89.6	56.8	151.3	8.2	30.0
Chloroethane		90.7	53.4	149.4	4.0	30.0
Trichlorofluoromethane		84.2	59.7	151.8	8.0	30.0
1,1-Dichloroethene		93.2	69.6	139.4	6.7	30.0
Methylene chloride		99.1	73.3	121.1	6.8	30.0
trans-1,2-Dichloroethene		90.2	73.6	129.3	8.0	30.0
1,1-Dichloroethane		93.7	71.5	126.2	7.1	30.0
cis-1,2-Dichloroethene		97.4	76.6	122.1	6.6	30.0
Tetrahydrofuran		79.3	59.0	117.9	16.7	30.0
Chloroform		91.9	78.4	124.0	7.2	30.0
Bromochloromethane		102.6	78.2	120.8	6.2	30.0
1,1,1-Trichloroethane		89.0	79.4	130.9	8.5	30.0
4-Methyl-2-pentanone (MIBK)		93.0	71.6	125.2	8.1	30.0
2-Hexanone		94.0	55.4	136.9	7.5	30.0
Carbon tetrachloride		94.0	72.6	133.0	7.1	30.0
Benzene		95.1	79.9	124.9	6.6	30.0
1,2-Dichloroethane		84.6	76.0	126.3	4.3	30.0
Trichloroethene		95.1	79.7	124.2	6.9	30.0
1,2-Dichloropropane		95.5	78.6	126.4	5.8	30.0
Bromodichloromethane		95.0	80.4	128.2	5.4	30.0
Dibromomethane		109.2	76.9	122.1	5.5	30.0
cis-1,3-Dichloropropene		99.8	79.8	129.9	6.4	30.0
Toluene		93.2	79.8	124.5	6.7	30.0
trans-1,3-Dichloropropene		99.0	74.0	131.3	5.9	30.0
1,1,2-Trichloroethane		94.7	78.7	123.1	7.8	30.0
Tetrachloroethene		99.8	74.5	124.5	6.8	30.0
trans-1,4-Dichloro-2-butene		85.4	68.6	135.4	10.4	30.0
Dibromochloromethane		110.3	74.6	127.2	3.6	30.0
1,2-Dibromoethane		104.3	70.3	133.7	5.0	30.0
Chlorobenzene		102.1	79.2	122.7	4.4	30.0

Organics - Volatiles, Prep Batch ID: VF230907W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230907A7.LCSDS07A, Parent Sample ID: 230907A7.LCSS07A

Run in Batch: 230907A7, Run Date: 09/07/2023 12:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		106.8	80.3	128.2	5.6	30.0
Ethylbenzene		99.2	79.5	129.1	5.3	30.0
p,m-Xylene		99.6	79.4	132.2	5.5	30.0
o-Xylene		98.7	80.2	131.0	4.9	30.0
Styrene		101.7	69.5	126.7	6.0	30.0
Isopropylbenzene		99.3	74.4	121.5	6.5	30.0
Bromoform		111.4	69.4	128.0	5.5	30.0
1,1,2,2-Tetrachloroethane		100.3	79.8	126.3	7.5	30.0
1,2,3-Trichloropropane		97.4	78.3	138.8	10.1	30.0
n-Propylbenzene		99.9	82.0	130.7	5.6	30.0
Bromobenzene		109.2	78.7	124.6	3.5	30.0
1,3,5-Trimethylbenzene		104.0	81.3	128.9	4.5	30.0
tert-Butylbenzene		95.1	80.7	128.9	5.1	30.0
1,2,4-Trimethylbenzene		102.2	81.4	130.8	5.5	30.0
sec-Butylbenzene		93.3	77.4	129.8	5.1	30.0
p-Isopropyltoluene		93.6	79.8	137.5	4.9	30.0
1,3-Dichlorobenzene		95.3	77.0	131.3	5.3	30.0
1,4-Dichlorobenzene		96.4	20.7	137.7	5.2	30.0
1,2-Dichlorobenzene		97.5	10.0	166.2	4.7	30.0
1,2,3-Trimethylbenzene		92.2	76.3	124.2	4.8	30.0
n-Butylbenzene		93.9	80.0	133.3	4.7	30.0
Hexachloroethane		101.8	23.8	138.1	5.3	30.0
1,2-Dibromo-3-chloropropane		104.1	21.2	189.4	8.7	30.0
1,2,4-Trichlorobenzene		110.6	27.4	143.4	4.0	30.0
1,2,3-Trichlorobenzene		111.9	75.4	131.4	2.7	30.0
Naphthalene		100.4	32.9	135.8	6.1	30.0
2-Methylnaphthalene		100.1	25.5	165.5	3.3	30.0

Organics - Volatiles, Prep Batch ID: VF230908W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230908B7.BLKW08B

Run in Batch: 230908B7, Run Date: 09/09/2023 00:12, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230908W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230908B7.BLKW08B

Run in Batch: 230908B7, Run Date: 09/09/2023 00:12, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 22:38, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		108.3	67.4	121.2
Acetone		94.8	29.9	161.5
Methyl iodide		112.2	68.8	116.4
Carbon disulfide		101.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		97.0	73.2	122.4
Acrylonitrile		97.6	69.9	128.9
2-Butanone (MEK)		93.7	44.0	134.4
Dichlorodifluoromethane		86.3	10.0	222.8
Chloromethane		89.8	23.8	166.5
Vinyl chloride		94.1	43.5	149.1
Bromomethane		86.2	56.8	151.3
Chloroethane		89.4	53.4	149.4
Trichlorofluoromethane		86.9	59.7	151.8
1,1-Dichloroethene		95.1	69.6	139.4
Methylene chloride		99.3	73.3	121.1
trans-1,2-Dichloroethene		92.5	73.6	129.3
1,1-Dichloroethane		95.1	71.5	126.2
cis-1,2-Dichloroethene		98.8	76.6	122.1
Tetrahydrofuran	*	57.4	59.0	117.9
Chloroform		92.9	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230908W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 22:38, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		102.5	78.2	120.8
1,1,1-Trichloroethane		92.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.4	71.6	125.2
2-Hexanone		111.8	55.4	136.9
Carbon tetrachloride		96.6	72.6	133.0
Benzene		98.1	79.9	124.9
1,2-Dichloroethane		84.7	76.0	126.3
Trichloroethene		100.1	79.7	124.2
1,2-Dichloropropane		97.3	78.6	126.4
Bromodichloromethane		96.5	80.4	128.2
Dibromomethane		112.7	76.9	122.1
cis-1,3-Dichloropropene		99.6	79.8	129.9
Toluene		95.0	79.8	124.5
trans-1,3-Dichloropropene		99.0	74.0	131.3
1,1,2-Trichloroethane		98.2	78.7	123.1
Tetrachloroethene		103.8	74.5	124.5
trans-1,4-Dichloro-2-butene		87.1	68.6	135.4
Dibromochloromethane		105.9	74.6	127.2
1,2-Dibromoethane		101.6	70.3	133.7
Chlorobenzene		100.9	79.2	122.7
1,1,1,2-Tetrachloroethane		106.8	80.3	128.2
Ethylbenzene		98.9	79.5	129.1
p,m-Xylene		98.9	79.4	132.2
o-Xylene		98.0	80.2	131.0
Styrene		101.8	69.5	126.7
Isopropylbenzene		98.6	74.4	121.5
Bromoform		109.7	69.4	128.0
1,1,2,2-Tetrachloroethane		97.6	79.8	126.3
1,2,3-Trichloropropane		101.5	78.3	138.8
n-Propylbenzene		97.7	82.0	130.7
Bromobenzene		109.3	78.7	124.6
1,3,5-Trimethylbenzene		101.4	81.3	128.9
tert-Butylbenzene		93.1	80.7	128.9
1,2,4-Trimethylbenzene		101.0	81.4	130.8
sec-Butylbenzene		87.6	77.4	129.8
p-Isopropyltoluene		88.7	79.8	137.5
1,3-Dichlorobenzene		93.4	77.0	131.3
1,4-Dichlorobenzene		94.6	20.7	137.7
1,2-Dichlorobenzene		93.8	10.0	166.2
1,2,3-Trimethylbenzene		88.6	76.3	124.2
n-Butylbenzene		85.7	80.0	133.3
Hexachloroethane		97.4	23.8	138.1
1,2-Dibromo-3-chloropropane		99.9	21.2	189.4
1,2,4-Trichlorobenzene		103.2	27.4	143.4
1,2,3-Trichlorobenzene		106.7	75.4	131.4
Naphthalene		95.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230908W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 22:38, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		90.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908B7.LCSDW08B, Parent Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 23:01, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		104.3	67.4	121.2	3.7	30.0
Acetone		87.4	29.9	161.5	8.2	30.0
Methyl iodide		106.4	68.8	116.4	5.3	30.0
Carbon disulfide		96.1	63.8	137.4	5.0	30.0
tert-Methyl butyl ether (MTBE)		93.6	73.2	122.4	3.5	30.0
Acrylonitrile		91.9	69.9	128.9	6.0	30.0
2-Butanone (MEK)		81.3	44.0	134.4	14.2	30.0
Dichlorodifluoromethane		82.5	10.0	222.8	4.5	30.0
Chloromethane		87.1	23.8	166.5	3.0	30.0
Vinyl chloride		88.2	43.5	149.1	6.5	30.0
Bromomethane		86.9	56.8	151.3	0.8	30.0
Chloroethane		85.0	53.4	149.4	5.1	30.0
Trichlorofluoromethane		83.4	59.7	151.8	4.1	30.0
1,1-Dichloroethene		89.8	69.6	139.4	5.7	30.0
Methylene chloride		95.3	73.3	121.1	4.1	30.0
trans-1,2-Dichloroethene		87.9	73.6	129.3	5.1	30.0
1,1-Dichloroethane		90.0	71.5	126.2	5.5	30.0
cis-1,2-Dichloroethene		94.1	76.6	122.1	4.9	30.0
Tetrahydrofuran		74.5	59.0	117.9	25.9	30.0
Chloroform		88.8	78.4	124.0	4.5	30.0
Bromochloromethane		99.5	78.2	120.8	3.0	30.0
1,1,1-Trichloroethane		88.1	79.4	130.9	4.8	30.0
4-Methyl-2-pentanone (MIBK)		87.9	71.6	125.2	11.3	30.0
2-Hexanone		84.5	55.4	136.9	27.8	30.0
Carbon tetrachloride		92.0	72.6	133.0	4.9	30.0
Benzene		93.5	79.9	124.9	4.9	30.0
1,2-Dichloroethane		82.1	76.0	126.3	3.1	30.0
Trichloroethene		94.3	79.7	124.2	5.9	30.0
1,2-Dichloropropane		94.2	78.6	126.4	3.2	30.0
Bromodichloromethane		93.3	80.4	128.2	3.4	30.0
Dibromomethane		109.4	76.9	122.1	2.9	30.0
cis-1,3-Dichloropropene		95.8	79.8	129.9	3.9	30.0
Toluene		90.7	79.8	124.5	4.6	30.0
trans-1,3-Dichloropropene		95.9	74.0	131.3	3.2	30.0
1,1,2-Trichloroethane		94.0	78.7	123.1	4.4	30.0
Tetrachloroethene		99.1	74.5	124.5	4.6	30.0
trans-1,4-Dichloro-2-butene		81.1	68.6	135.4	7.1	30.0
Dibromochloromethane		103.6	74.6	127.2	2.3	30.0
1,2-Dibromoethane		98.4	70.3	133.7	3.2	30.0
Chlorobenzene		97.2	79.2	122.7	3.7	30.0

Organics - Volatiles, Prep Batch ID: VF230908W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230908B7.LCSDW08B, Parent Sample ID: 230908B7.LCSW08X

Run in Batch: 230908B7, Run Date: 09/08/2023 23:01, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		103.4	80.3	128.2	3.3	30.0
Ethylbenzene		94.7	79.5	129.1	4.4	30.0
p,m-Xylene		95.1	79.4	132.2	3.9	30.0
o-Xylene		94.3	80.2	131.0	3.8	30.0
Styrene		97.8	69.5	126.7	4.1	30.0
Isopropylbenzene		95.2	74.4	121.5	3.5	30.0
Bromoform		104.4	69.4	128.0	5.0	30.0
1,1,2,2-Tetrachloroethane		92.4	79.8	126.3	5.6	30.0
1,2,3-Trichloropropane		93.2	78.3	138.8	8.5	30.0
n-Propylbenzene		94.0	82.0	130.7	3.9	30.0
Bromobenzene		106.0	78.7	124.6	3.1	30.0
1,3,5-Trimethylbenzene		98.1	81.3	128.9	3.4	30.0
tert-Butylbenzene		90.6	80.7	128.9	2.7	30.0
1,2,4-Trimethylbenzene		97.1	81.4	130.8	3.9	30.0
sec-Butylbenzene		87.8	77.4	129.8	0.3	30.0
p-Isopropyltoluene		88.2	79.8	137.5	0.5	30.0
1,3-Dichlorobenzene		92.3	77.0	131.3	1.2	30.0
1,4-Dichlorobenzene		93.4	20.7	137.7	1.3	30.0
1,2-Dichlorobenzene		93.7	10.0	166.2	0.2	30.0
1,2,3-Trimethylbenzene		87.7	76.3	124.2	1.1	30.0
n-Butylbenzene		85.5	80.0	133.3	0.3	30.0
Hexachloroethane		97.5	23.8	138.1	0.1	30.0
1,2-Dibromo-3-chloropropane		95.7	21.2	189.4	4.3	30.0
1,2,4-Trichlorobenzene		105.2	27.4	143.4	1.9	30.0
1,2,3-Trichlorobenzene		102.8	75.4	131.4	3.7	30.0
Naphthalene		92.0	32.9	135.8	3.4	30.0
2-Methylnaphthalene		89.4	25.5	165.5	0.7	30.0

Merit Laboratories Login Checklist

Lab Set ID: S52828
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing GWS - 30171056.00102 Plant 6
Submitted: 08/30/2023 16:05 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 11.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.:
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.00102 | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Special Instructions
52828.01	8/29/23	1100	mw-22-154_082923	GW	3		3							3	
.02	8/29/23	1225	mw-20-131_082923	GW	3		3							3	
.03/.04/.05	8/29/23	1320	mw-20-132_082923	GW	9		9							9	MS/MSD
.06	8/29/23	—	DUP-03_082923	GW	3		3							3	
.07															

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Austin Westhuis (Sampler)	8/30/23	1605
RECEIVED BY: SIGNATURE/ORGANIZATION	8/30/23	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S52830.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S52830.01-S52830.07
Project: RACER Lansing GWS - 30171056.0470A Plant 2
Collected Date(s): 08/29/2023
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Donald Richmond
P.O. #: 30171056.0470A

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QC Report (Pages 19-67)



Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S52830.01	MW-22-157_082923	Groundwater	08/29/23 11:10
S52830.02	MW-22-155_082923	Groundwater	08/29/23 12:20
S52830.03	MW-22-153_082923	Groundwater	08/29/23 13:45
S52830.04	MW-22-156_082923	Groundwater	08/29/23 14:30
S52830.05	MW-14-58R_082923	Groundwater	08/29/23 15:45
S52830.06	Trip Blank	Water	08/29/23 00:01
S52830.07	DUP-06_082923	Groundwater	08/29/23 00:01

Lab Sample ID: S52830.01
Sample Tag: MW-22-157_082923
Collected Date/Time: 08/29/2023 11:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	123	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 05:37, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.01 (continued)
Sample Tag: MW-22-157_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 05:37, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S52830.02
Sample Tag: MW-22-155_082923
Collected Date/Time: 08/29/2023 12:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 20:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	160	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.03
Sample Tag: MW-22-153_082923
Collected Date/Time: 08/29/2023 13:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	18	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:25, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.03 (continued)
Sample Tag: MW-22-153_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:25, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.04
Sample Tag: MW-22-156_082923
Collected Date/Time: 08/29/2023 14:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	144	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 08:22, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	20	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	300	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.04 (continued)
Sample Tag: MW-22-156_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 08:22, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S52830.05
Sample Tag: MW-14-58R_082923
Collected Date/Time: 08/29/2023 15:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 16:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	250	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:48, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.05 (continued)
Sample Tag: MW-14-58R_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:48, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.06
Sample Tag: Trip Blank
Collected Date/Time: 08/29/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/06/23 20:59, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52830.06 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/06/23 20:59, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.07
Sample Tag: DUP-06_082923
Collected Date/Time: 08/29/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 05:39, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	117	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 07:12, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.07 (continued)
Sample Tag: DUP-06_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 07:12, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S52830.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S52830.01-S52830.07
Project: RACER Lansing GWS - 30171056.0470A Plant 2
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Donald Richmond
P.O. #: 30171056.0470A

QC Report Sections

Cover Page (Page 19)
Analysis Summary (Pages 20-26)
Prep Batch Summary (Page 27)
Surrogates per Lab Sample (Pages 28-34)
Surrogates per QC Sample (Pages 35-39)
Internal Standards per Lab Sample (Pages 40-46)
Internal Standards per QC Sample (Pages 47-51)
Batch QC Results (Pages 52-67)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S52830.01
Sample Tag: MW-22-157_082923
Collected Date/Time: 08/29/2023 11:10
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 19:12	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 05:37	230906B7	VF230906W3	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S52830.02
Sample Tag: MW-22-155_082923
Collected Date/Time: 08/29/2023 12:20
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 20:35	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52830.03

Sample Tag: MW-22-153_082923

Collected Date/Time: 08/29/2023 13:45

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 19:33	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 06:25	230906B7	VF230906W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S52830.04

Sample Tag: MW-22-156_082923

Collected Date/Time: 08/29/2023 14:30

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/07/23 19:53	230907A9	VS230907W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 08:22	230906B7	VF230906W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S52830.05

Sample Tag: MW-14-58R_082923

Collected Date/Time: 08/29/2023 15:45

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 16:53	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 06:48	230906B7	VF230906W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S52830.06

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	09/06/23 20:59	230906A7	VF230906W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52830.07

Sample Tag: DUP-06_082923

Collected Date/Time: 08/29/2023 00:01

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 05:39	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 07:12	230906B7	VF230906W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF230906W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52830.06	Volatile Organics - DEQ List	SW5030C/8260C	09/06/23 20:59	230906A7

Organics - Volatiles, Prep Batch ID: VF230906W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52830.01	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 05:37	230906B7
S52830.03	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 06:25	230906B7
S52830.04	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 08:22	230906B7
S52830.05	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 06:48	230906B7
S52830.07	Volatile Organics - DEQ List	SW5030C/8260C	09/07/23 07:12	230906B7

Organics - Volatiles, Prep Batch ID: VS230907W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52830.01	1,4-Dioxane	SW8260B - SIM	09/07/23 19:12	230907A9
S52830.02	1,4-Dioxane	SW8260B - SIM	09/07/23 20:35	230907A9
S52830.03	1,4-Dioxane	SW8260B - SIM	09/07/23 19:33	230907A9
S52830.04	1,4-Dioxane	SW8260B - SIM	09/07/23 19:53	230907A9

Organics - Volatiles, Prep Batch ID: VS230907W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52830.07	1,4-Dioxane	SW8260B - SIM	09/08/23 05:39	230907B9

Organics - Volatiles, Prep Batch ID: VS230908W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52830.05	1,4-Dioxane	SW8260B - SIM	09/08/23 16:53	230908A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.01

Sample Tag: MW-22-157_082923

Collected Date/Time: 08/29/2023 11:10

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 05:37, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**107.8**	80.0	124.0
1,2-Dichloroethane-D4		**83.7**	72.0	125.0
Toluene-D8		**94.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.02

Sample Tag: MW-22-155_082923

Collected Date/Time: 08/29/2023 12:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 20:35, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.03

Sample Tag: MW-22-153_082923

Collected Date/Time: 08/29/2023 13:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:33, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 06:25, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.4**	80.0	124.0
1,2-Dichloroethane-D4		**92.7**	72.0	125.0
Toluene-D8		**94.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.04

Sample Tag: MW-22-156_082923

Collected Date/Time: 08/29/2023 14:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**100.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 08:22, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.1**	80.0	124.0
1,2-Dichloroethane-D4		**93.0**	72.0	125.0
Toluene-D8		**94.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.05

Sample Tag: MW-14-58R_082923

Collected Date/Time: 08/29/2023 15:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 06:48, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.4**	80.0	124.0
1,2-Dichloroethane-D4		**87.0**	72.0	125.0
Toluene-D8		**94.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.06

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906A7, Run Date: 09/06/2023 20:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**106.5**	80.0	124.0
1,2-Dichloroethane-D4		**90.0**	72.0	125.0
Toluene-D8		**93.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S52830.07

Sample Tag: DUP-06_082923

Collected Date/Time: 08/29/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 07:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.3**	80.0	124.0
1,2-Dichloroethane-D4		**85.8**	72.0	125.0
Toluene-D8		**94.1**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF230906W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230906A7.BLKW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 13:57, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**106.8**	80.0	124.0
1,2-Dichloroethane-D4		**90.9**	72.0	125.0
Toluene-D8		**95.1**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 11:37, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.0**	80.0	124.0
1,2-Dichloroethane-D4		**88.5**	72.0	125.0
Toluene-D8		**93.9**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906A7.LCSDW06A, Parent Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 12:00, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.0**	80.0	124.0
1,2-Dichloroethane-D4		**85.5**	72.0	125.0
Toluene-D8		**93.7**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 230906A7.5280304M, Parent Sample ID: S52803.03

Run in Batch: 230906A7, Run Date: 09/06/2023 12:24, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**111.9**	80.0	124.0
1,2-Dichloroethane-D4		**86.5**	72.0	125.0
Toluene-D8		**94.2**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230906A7.5280305N, Parent Sample ID: 230906A7.5280304M

Run in Batch: 230906A7, Run Date: 09/06/2023 12:47, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**112.2**	80.0	124.0
1,2-Dichloroethane-D4		**95.3**	72.0	125.0
Toluene-D8		**94.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF230906W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230906B7.BLKW06B

Run in Batch: 230906B7, Run Date: 09/07/2023 00:54, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**107.8**	80.0	124.0
1,2-Dichloroethane-D4		**83.9**	72.0	125.0
Toluene-D8		**93.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:20, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**115.3**	80.0	124.0
1,2-Dichloroethane-D4		**88.5**	72.0	125.0
Toluene-D8		**94.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906B7.LCSDW06B, Parent Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:44, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**115.2**	80.0	124.0
1,2-Dichloroethane-D4		**90.7**	72.0	125.0
Toluene-D8		**93.9**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**95.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**97.5**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230908W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.01

Sample Tag: MW-22-157_082923

Collected Date/Time: 08/29/2023 11:10

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**102.2**	50.0	200.0
1,4-Dioxane-D8		**97.0**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**94.6**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 05:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**94.6**	50.0	200.0
1,4-Difluorobenzene		**92.2**	50.0	200.0
Chlorobenzene-D5		**88.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**84.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.02

Sample Tag: MW-22-155_082923

Collected Date/Time: 08/29/2023 12:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 20:35, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**101.9**	50.0	200.0
1,4-Dioxane-D8		**86.4**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**91.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.03

Sample Tag: MW-22-153_082923

Collected Date/Time: 08/29/2023 13:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**103.9**	50.0	200.0
1,4-Dioxane-D8		**99.0**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**95.5**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 06:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**99.5**	50.0	200.0
1,4-Difluorobenzene		**101.3**	50.0	200.0
Chlorobenzene-D5		**100.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.04

Sample Tag: MW-22-156_082923

Collected Date/Time: 08/29/2023 14:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907A9, Run Date: 09/07/2023 19:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**101.4**	50.0	200.0
1,4-Dioxane-D8		**88.3**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**95.7**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 08:22, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**100.2**	50.0	200.0
1,4-Difluorobenzene		**101.1**	50.0	200.0
Chlorobenzene-D5		**100.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.05

Sample Tag: MW-14-58R_082923

Collected Date/Time: 08/29/2023 15:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230908A9, Run Date: 09/08/2023 16:53, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**91.3**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 06:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**92.2**	50.0	200.0
1,4-Difluorobenzene		**91.5**	50.0	200.0
Chlorobenzene-D5		**88.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.06

Sample Tag: Trip Blank

Collected Date/Time: 08/29/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906A7, Run Date: 09/06/2023 20:59, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**96.1**	50.0	200.0
1,4-Difluorobenzene		**96.6**	50.0	200.0
Chlorobenzene-D5		**96.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**90.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52830.07

Sample Tag: DUP-06_082923

Collected Date/Time: 08/29/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 05:39, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.3**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 230906B7, Run Date: 09/07/2023 07:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**94.7**	50.0	200.0
1,4-Difluorobenzene		**92.6**	50.0	200.0
Chlorobenzene-D5		**89.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230906W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230906A7.BLKW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 13:57, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.5**	50.0	200.0
1,4-Difluorobenzene		**97.2**	50.0	200.0
Chlorobenzene-D5		**99.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**93.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 11:37, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**103.2**	50.0	200.0
1,4-Difluorobenzene		**102.9**	50.0	200.0
Chlorobenzene-D5		**103.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906A7.LCSDW06A, Parent Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 12:00, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.7**	50.0	200.0
1,4-Difluorobenzene		**98.7**	50.0	200.0
Chlorobenzene-D5		**97.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.4**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230906A7.5280304M, Parent Sample ID: S52803.03

Run in Batch: 230906A7, Run Date: 09/06/2023 12:24, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.6**	50.0	200.0
1,4-Difluorobenzene		**98.9**	50.0	200.0
Chlorobenzene-D5		**98.4**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230906A7.5280305N, Parent Sample ID: 230906A7.5280304M

Run in Batch: 230906A7, Run Date: 09/06/2023 12:47, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**107.4**	50.0	200.0
1,4-Difluorobenzene		**110.3**	50.0	200.0
Chlorobenzene-D5		**114.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**113.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF230906W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230906B7.BLKW06B

Run in Batch: 230906B7, Run Date: 09/07/2023 00:54, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.4**	50.0	200.0
1,4-Difluorobenzene		**93.8**	50.0	200.0
Chlorobenzene-D5		**89.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**85.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:20, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**103.5**	50.0	200.0
1,4-Difluorobenzene		**102.3**	50.0	200.0
Chlorobenzene-D5		**100.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906B7.LCSDW06B, Parent Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:44, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**105.1**	50.0	200.0
1,4-Difluorobenzene		**104.9**	50.0	200.0
Chlorobenzene-D5		**103.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.3**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**99.8**	50.0	200.0
1,4-Dioxane-D8		**104.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**94.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**100.0**	50.0	200.0
1,4-Dioxane-D8		**100.0**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**100.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**87.9**	50.0	200.0
1,4-Dioxane-D8		**95.3**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**91.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**102.4**	50.0	200.0
1,4-Dioxane-D8		**96.8**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**93.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**102.5**	50.0	200.0
1,4-Dioxane-D8		**93.2**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**92.4**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.3**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230908W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**79.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF230906W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230906A7.BLKW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 13:57, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 230906A7.BLKW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 13:57, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 11:37, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		115.4	67.4	121.2
Acetone		124.2	29.9	161.5
Methyl iodide		115.3	68.8	116.4
Carbon disulfide		108.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		109.0	73.2	122.4
Acrylonitrile		109.6	69.9	128.9
2-Butanone (MEK)		100.9	44.0	134.4
Dichlorodifluoromethane		82.2	10.0	222.8
Chloromethane		92.8	23.8	166.5
Vinyl chloride		94.8	43.5	149.1
Bromomethane		92.9	56.8	151.3
Chloroethane		92.1	53.4	149.4
Trichlorofluoromethane		84.2	59.7	151.8
1,1-Dichloroethene		98.1	69.6	139.4
Methylene chloride		108.3	73.3	121.1
trans-1,2-Dichloroethene		98.7	73.6	129.3
1,1-Dichloroethane		102.4	71.5	126.2
cis-1,2-Dichloroethene		106.6	76.6	122.1
Tetrahydrofuran		95.7	59.0	117.9
Chloroform		100.4	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 11:37, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		110.5	78.2	120.8
1,1,1-Trichloroethane		98.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.5	71.6	125.2
2-Hexanone		102.2	55.4	136.9
Carbon tetrachloride		96.3	72.6	133.0
Benzene		98.4	79.9	124.9
1,2-Dichloroethane		86.3	76.0	126.3
Trichloroethene		97.4	79.7	124.2
1,2-Dichloropropane		99.7	78.6	126.4
Bromodichloromethane		101.4	80.4	128.2
Dibromomethane		111.8	76.9	122.1
cis-1,3-Dichloropropene		105.1	79.8	129.9
Toluene		95.7	79.8	124.5
trans-1,3-Dichloropropene		104.7	74.0	131.3
1,1,2-Trichloroethane		99.3	78.7	123.1
Tetrachloroethene		97.7	74.5	124.5
trans-1,4-Dichloro-2-butene		98.8	68.6	135.4
Dibromochloromethane		114.4	74.6	127.2
1,2-Dibromoethane		107.4	70.3	133.7
Chlorobenzene		103.7	79.2	122.7
1,1,1,2-Tetrachloroethane		111.0	80.3	128.2
Ethylbenzene		101.2	79.5	129.1
p,m-Xylene		102.0	79.4	132.2
o-Xylene		100.9	80.2	131.0
Styrene		105.0	69.5	126.7
Isopropylbenzene		100.9	74.4	121.5
Bromoform		118.7	69.4	128.0
1,1,2,2-Tetrachloroethane		105.5	79.8	126.3
1,2,3-Trichloropropane		105.4	78.3	138.8
n-Propylbenzene		101.4	82.0	130.7
Bromobenzene		109.4	78.7	124.6
1,3,5-Trimethylbenzene		105.2	81.3	128.9
tert-Butylbenzene		97.2	80.7	128.9
1,2,4-Trimethylbenzene		104.1	81.4	130.8
sec-Butylbenzene		96.5	77.4	129.8
p-Isopropyltoluene		96.5	79.8	137.5
1,3-Dichlorobenzene		99.9	77.0	131.3
1,4-Dichlorobenzene		101.1	20.7	137.7
1,2-Dichlorobenzene		101.3	10.0	166.2
1,2,3-Trimethylbenzene		97.0	76.3	124.2
n-Butylbenzene		96.4	80.0	133.3
Hexachloroethane		111.2	23.8	138.1
1,2-Dibromo-3-chloropropane		115.2	21.2	189.4
1,2,4-Trichlorobenzene		110.2	27.4	143.4
1,2,3-Trichlorobenzene		111.7	75.4	131.4
Naphthalene		105.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 11:37, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		99.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906A7.LCSDW06A, Parent Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 12:00, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		119.2	67.4	121.2	3.3	30.0
Acetone		134.9	29.9	161.5	8.3	30.0
Methyl iodide		115.1	68.8	116.4	0.2	30.0
Carbon disulfide		104.5	63.8	137.4	3.4	30.0
tert-Methyl butyl ether (MTBE)		113.6	73.2	122.4	4.2	30.0
Acrylonitrile		113.4	69.9	128.9	3.4	30.0
2-Butanone (MEK)		108.7	44.0	134.4	7.5	30.0
Dichlorodifluoromethane		82.1	10.0	222.8	0.1	30.0
Chloromethane		92.2	23.8	166.5	0.6	30.0
Vinyl chloride		92.5	43.5	149.1	2.5	30.0
Bromomethane		89.6	56.8	151.3	3.6	30.0
Chloroethane		91.4	53.4	149.4	0.8	30.0
Trichlorofluoromethane		83.7	59.7	151.8	0.6	30.0
1,1-Dichloroethene		96.1	69.6	139.4	2.1	30.0
Methylene chloride		108.2	73.3	121.1	0.1	30.0
trans-1,2-Dichloroethene		96.1	73.6	129.3	2.6	30.0
1,1-Dichloroethane		99.3	71.5	126.2	3.1	30.0
cis-1,2-Dichloroethene		104.0	76.6	122.1	2.5	30.0
Tetrahydrofuran		105.5	59.0	117.9	9.7	30.0
Chloroform		98.6	78.4	124.0	1.9	30.0
Bromochloromethane		112.0	78.2	120.8	1.3	30.0
1,1,1-Trichloroethane		95.8	79.4	130.9	2.9	30.0
4-Methyl-2-pentanone (MIBK)		109.0	71.6	125.2	8.2	30.0
2-Hexanone		109.9	55.4	136.9	7.3	30.0
Carbon tetrachloride		94.6	72.6	133.0	1.8	30.0
Benzene		98.2	79.9	124.9	0.2	30.0
1,2-Dichloroethane		88.7	76.0	126.3	2.8	30.0
Trichloroethene		95.8	79.7	124.2	1.7	30.0
1,2-Dichloropropane		100.7	78.6	126.4	1.0	30.0
Bromodichloromethane		100.7	80.4	128.2	0.7	30.0
Dibromomethane		114.5	76.9	122.1	2.4	30.0
cis-1,3-Dichloropropene		106.2	79.8	129.9	1.1	30.0
Toluene		95.8	79.8	124.5	0.0	30.0
trans-1,3-Dichloropropene		108.6	74.0	131.3	3.7	30.0
1,1,2-Trichloroethane		103.6	78.7	123.1	4.3	30.0
Tetrachloroethene		97.0	74.5	124.5	0.7	30.0
trans-1,4-Dichloro-2-butene		106.7	68.6	135.4	7.6	30.0
Dibromochloromethane		119.1	74.6	127.2	4.0	30.0
1,2-Dibromoethane		112.5	70.3	133.7	4.6	30.0
Chlorobenzene		104.6	79.2	122.7	0.9	30.0

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230906A7.LCSDW06A, Parent Sample ID: 230906A7.LCSW06A

Run in Batch: 230906A7, Run Date: 09/06/2023 12:00, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		112.7	80.3	128.2	1.5	30.0
Ethylbenzene		101.9	79.5	129.1	0.7	30.0
p,m-Xylene		102.3	79.4	132.2	0.4	30.0
o-Xylene		101.2	80.2	131.0	0.3	30.0
Styrene		106.4	69.5	126.7	1.3	30.0
Isopropylbenzene		101.0	74.4	121.5	0.2	30.0
Bromoform		126.1	69.4	128.0	6.0	30.0
1,1,2,2-Tetrachloroethane		113.5	79.8	126.3	7.3	30.0
1,2,3-Trichloropropane		111.2	78.3	138.8	5.4	30.0
n-Propylbenzene		101.0	82.0	130.7	0.4	30.0
Bromobenzene		113.0	78.7	124.6	3.3	30.0
1,3,5-Trimethylbenzene		104.5	81.3	128.9	0.7	30.0
tert-Butylbenzene		97.1	80.7	128.9	0.0	30.0
1,2,4-Trimethylbenzene		103.7	81.4	130.8	0.3	30.0
sec-Butylbenzene		97.6	77.4	129.8	1.1	30.0
p-Isopropyltoluene		97.0	79.8	137.5	0.5	30.0
1,3-Dichlorobenzene		102.7	77.0	131.3	2.7	30.0
1,4-Dichlorobenzene		103.6	20.7	137.7	2.5	30.0
1,2-Dichlorobenzene		106.3	10.0	166.2	4.7	30.0
1,2,3-Trimethylbenzene		98.8	76.3	124.2	1.8	30.0
n-Butylbenzene		96.9	80.0	133.3	0.5	30.0
Hexachloroethane		110.0	23.8	138.1	1.0	30.0
1,2-Dibromo-3-chloropropane		126.8	21.2	189.4	9.6	30.0
1,2,4-Trichlorobenzene		117.1	27.4	143.4	6.0	30.0
1,2,3-Trichlorobenzene		121.2	75.4	131.4	8.1	30.0
Naphthalene		117.1	32.9	135.8	10.8	30.0
2-Methylnaphthalene		119.1	25.5	165.5	17.8	30.0

Matrix Spike (MS)

Lab Sample ID: 230906A7.5280304M, Parent Sample ID: S52803.03

Run in Batch: 230906A7, Run Date: 09/06/2023 12:24, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		112.7	67.4	121.2
Acetone		94.9	29.9	161.5
Methyl iodide		116.4	68.8	116.4
Carbon disulfide		111.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		108.7	73.2	122.4
Acrylonitrile		107.4	69.9	128.9
2-Butanone (MEK)		96.6	44.0	134.4
Dichlorodifluoromethane		93.1	10.0	222.8
Chloromethane		97.8	23.8	166.5
Vinyl chloride		102.2	43.5	149.1
Bromomethane		94.8	56.8	151.3
Chloroethane		94.5	53.4	149.4
Trichlorofluoromethane		93.1	59.7	151.8
1,1-Dichloroethene		101.0	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230906A7.5280304M, Parent Sample ID: S52803.03

Run in Batch: 230906A7, Run Date: 09/06/2023 12:24, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		106.5	73.3	121.1
trans-1,2-Dichloroethene		100.1	73.6	129.3
1,1-Dichloroethane		102.8	71.5	126.2
cis-1,2-Dichloroethene		105.5	76.6	122.1
Tetrahydrofuran		92.5	59.0	117.9
Chloroform		100.3	78.4	124.0
Bromochloromethane		110.7	78.2	120.8
1,1,1-Trichloroethane		100.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.1	71.6	125.2
2-Hexanone		96.8	55.4	136.9
Carbon tetrachloride		101.4	72.6	133.0
Benzene		99.2	79.9	124.9
1,2-Dichloroethane		86.3	76.0	126.3
Trichloroethene		99.4	79.7	124.2
1,2-Dichloropropane		100.4	78.6	126.4
Bromodichloromethane		100.7	80.4	128.2
Dibromomethane		111.8	76.9	122.1
cis-1,3-Dichloropropene		104.8	79.8	129.9
Toluene		96.8	79.8	124.5
trans-1,3-Dichloropropene		106.4	74.0	131.3
1,1,2-Trichloroethane		97.8	78.7	123.1
Tetrachloroethene		107.1	74.5	124.5
trans-1,4-Dichloro-2-butene		98.2	68.6	135.4
Dibromochloromethane		76.4	74.6	127.2
1,2-Dibromoethane		107.5	70.3	133.7
Chlorobenzene		104.9	79.2	122.7
1,1,1,2-Tetrachloroethane		112.1	80.3	128.2
Ethylbenzene		103.5	79.5	129.1
p,m-Xylene		103.8	79.4	132.2
o-Xylene		102.6	80.2	131.0
Styrene		105.6	69.5	126.7
Isopropylbenzene		104.0	74.4	121.5
Bromoform		118.8	69.4	128.0
1,1,2,2-Tetrachloroethane		103.4	79.8	126.3
1,2,3-Trichloropropane		102.9	78.3	138.8
n-Propylbenzene		105.3	82.0	130.7
Bromobenzene		112.1	78.7	124.6
1,3,5-Trimethylbenzene		106.4	81.3	128.9
tert-Butylbenzene		99.6	80.7	128.9
1,2,4-Trimethylbenzene		105.9	81.4	130.8
sec-Butylbenzene		100.8	77.4	129.8
p-Isopropyltoluene		100.2	79.8	137.5
1,3-Dichlorobenzene		102.2	77.0	131.3
1,4-Dichlorobenzene		102.8	20.7	137.7
1,2-Dichlorobenzene		103.7	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 230906A7.5280304M, Parent Sample ID: S52803.03

Run in Batch: 230906A7, Run Date: 09/06/2023 12:24, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		101.1	80.0	133.3
Hexachloroethane		113.7	23.8	138.1
1,2-Dibromo-3-chloropropane		113.1	21.2	189.4
1,2,4-Trichlorobenzene		114.2	27.4	143.4
1,2,3-Trichlorobenzene		113.0	75.4	131.4
Naphthalene		104.7	32.9	135.8
2-Methylnaphthalene		104.2	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230906A7.5280305N, Parent Sample ID: 230906A7.5280304M

Run in Batch: 230906A7, Run Date: 09/06/2023 12:47, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		120.7	67.4	121.2	6.9	30.0
Acetone		96.9	29.9	161.5	1.9	30.0
Methyl iodide		114.2	68.8	116.4	1.9	30.0
Carbon disulfide		102.7	63.8	137.4	8.6	30.0
tert-Methyl butyl ether (MTBE)		115.5	73.2	122.4	6.1	30.0
Acrylonitrile		105.9	69.9	128.9	1.4	30.0
2-Butanone (MEK)		99.7	44.0	134.4	3.1	30.0
Dichlorodifluoromethane		84.9	10.0	222.8	9.2	30.0
Chloromethane		92.5	23.8	166.5	5.6	30.0
Vinyl chloride		94.4	43.5	149.1	8.0	30.0
Bromomethane		93.7	56.8	151.3	1.2	30.0
Chloroethane		93.0	53.4	149.4	1.6	30.0
Trichlorofluoromethane		84.6	59.7	151.8	9.6	30.0
1,1-Dichloroethene		94.5	69.6	139.4	6.6	30.0
Methylene chloride		109.6	73.3	121.1	2.9	30.0
trans-1,2-Dichloroethene		95.2	73.6	129.3	5.0	30.0
1,1-Dichloroethane		101.1	71.5	126.2	1.7	30.0
cis-1,2-Dichloroethene		104.7	76.6	122.1	0.7	30.0
Tetrahydrofuran		87.0	59.0	117.9	5.8	30.0
Chloroform		100.0	78.4	124.0	0.3	30.0
Bromochloromethane		113.9	78.2	120.8	2.9	30.0
1,1,1-Trichloroethane		94.3	79.4	130.9	6.4	30.0
4-Methyl-2-pentanone (MIBK)		97.8	71.6	125.2	0.3	30.0
2-Hexanone		99.0	55.4	136.9	2.3	30.0
Carbon tetrachloride		89.9	72.6	133.0	12.0	30.0
Benzene		93.4	79.9	124.9	6.0	30.0
1,2-Dichloroethane		88.0	76.0	126.3	2.0	30.0
Trichloroethene		91.6	79.7	124.2	7.9	30.0
1,2-Dichloropropane		97.9	78.6	126.4	2.5	30.0
Bromodichloromethane		99.3	80.4	128.2	1.4	30.0
Dibromomethane		111.1	76.9	122.1	0.6	30.0
cis-1,3-Dichloropropene		106.0	79.8	129.9	1.1	30.0
Toluene		91.7	79.8	124.5	5.5	30.0
trans-1,3-Dichloropropene		107.5	74.0	131.3	1.1	30.0

Organics - Volatiles, Prep Batch ID: VF230906W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 230906A7.5280305N, Parent Sample ID: 230906A7.5280304M

Run in Batch: 230906A7, Run Date: 09/06/2023 12:47, Prep Date: 09/06/2023, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		98.3	78.7	123.1	0.5	30.0
Tetrachloroethene		95.9	74.5	124.5	8.0	30.0
trans-1,4-Dichloro-2-butene		96.0	68.6	135.4	2.2	30.0
Dibromochloromethane	*	71.0	74.6	127.2	4.8	30.0
1,2-Dibromoethane		102.7	70.3	133.7	4.6	30.0
Chlorobenzene		97.4	79.2	122.7	7.4	30.0
1,1,1,2-Tetrachloroethane		106.6	80.3	128.2	5.0	30.0
Ethylbenzene		92.1	79.5	129.1	11.7	30.0
p,m-Xylene		94.2	79.4	132.2	9.7	30.0
o-Xylene		93.3	80.2	131.0	9.6	30.0
Styrene		98.7	69.5	126.7	6.7	30.0
Isopropylbenzene		92.5	74.4	121.5	11.7	30.0
Bromoform		114.1	69.4	128.0	4.0	30.0
1,1,2,2-Tetrachloroethane		97.9	79.8	126.3	5.5	30.0
1,2,3-Trichloropropane		98.0	78.3	138.8	4.9	30.0
n-Propylbenzene		91.6	82.0	130.7	14.0	30.0
Bromobenzene		105.9	78.7	124.6	5.7	30.0
1,3,5-Trimethylbenzene		95.4	81.3	128.9	10.9	30.0
tert-Butylbenzene		88.0	80.7	128.9	12.4	30.0
1,2,4-Trimethylbenzene		96.4	81.4	130.8	9.4	30.0
sec-Butylbenzene		86.5	77.4	129.8	15.2	30.0
p-Isopropyltoluene		86.7	79.8	137.5	14.4	30.0
1,3-Dichlorobenzene		95.1	77.0	131.3	7.2	30.0
1,4-Dichlorobenzene		95.9	20.7	137.7	6.9	30.0
1,2-Dichlorobenzene		97.2	10.0	166.2	6.5	30.0
1,2,3-Trimethylbenzene		91.7	76.3	124.2	8.8	30.0
n-Butylbenzene		87.3	80.0	133.3	14.7	30.0
Hexachloroethane		100.6	23.8	138.1	12.3	30.0
1,2-Dibromo-3-chloropropane		104.5	21.2	189.4	7.9	30.0
1,2,4-Trichlorobenzene		107.6	27.4	143.4	5.9	30.0
1,2,3-Trichlorobenzene		110.4	75.4	131.4	2.3	30.0
Naphthalene		98.9	32.9	135.8	5.7	30.0
2-Methylnaphthalene		105.3	25.5	165.5	1.0	30.0

Organics - Volatiles, Prep Batch ID: VF230906W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230906B7.BLKW06B

Run in Batch: 230906B7, Run Date: 09/07/2023 00:54, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF230906W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 230906B7.BLKW06B

Run in Batch: 230906B7, Run Date: 09/07/2023 00:54, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:20, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether	*	130.2	67.4	121.2
Acetone		122.5	29.9	161.5
Methyl iodide	*	126.1	68.8	116.4
Carbon disulfide		113.5	63.8	137.4
tert-Methyl butyl ether (MTBE)		116.3	73.2	122.4
Acrylonitrile		109.4	69.9	128.9
2-Butanone (MEK)		99.7	44.0	134.4
Dichlorodifluoromethane		92.9	10.0	222.8
Chloromethane		100.5	23.8	166.5
Vinyl chloride		100.5	43.5	149.1
Bromomethane		94.4	56.8	151.3
Chloroethane		96.4	53.4	149.4
Trichlorofluoromethane		93.6	59.7	151.8
1,1-Dichloroethene		104.6	69.6	139.4
Methylene chloride		119.3	73.3	121.1
trans-1,2-Dichloroethene		103.9	73.6	129.3
1,1-Dichloroethane		109.5	71.5	126.2
cis-1,2-Dichloroethene		113.9	76.6	122.1
Tetrahydrofuran		95.8	59.0	117.9
Chloroform		109.9	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF230906W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:20, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane	*	122.8	78.2	120.8
1,1,1-Trichloroethane		102.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.1	71.6	125.2
2-Hexanone		102.1	55.4	136.9
Carbon tetrachloride		102.6	72.6	133.0
Benzene		108.0	79.9	124.9
1,2-Dichloroethane		97.5	76.0	126.3
Trichloroethene		105.4	79.7	124.2
1,2-Dichloropropane		111.2	78.6	126.4
Bromodichloromethane		111.2	80.4	128.2
Dibromomethane	*	125.2	76.9	122.1
cis-1,3-Dichloropropene		114.7	79.8	129.9
Toluene		105.1	79.8	124.5
trans-1,3-Dichloropropene		114.4	74.0	131.3
1,1,2-Trichloroethane		112.0	78.7	123.1
Tetrachloroethene		106.7	74.5	124.5
trans-1,4-Dichloro-2-butene		94.8	68.6	135.4
Dibromochloromethane		123.4	74.6	127.2
1,2-Dibromoethane		114.4	70.3	133.7
Chlorobenzene		112.9	79.2	122.7
1,1,1,2-Tetrachloroethane		120.1	80.3	128.2
Ethylbenzene		107.4	79.5	129.1
p,m-Xylene		107.3	79.4	132.2
o-Xylene		107.5	80.2	131.0
Styrene		114.3	69.5	126.7
Isopropylbenzene		106.9	74.4	121.5
Bromoform		124.6	69.4	128.0
1,1,2,2-Tetrachloroethane		108.1	79.8	126.3
1,2,3-Trichloropropane		108.2	78.3	138.8
n-Propylbenzene		104.5	82.0	130.7
Bromobenzene		121.6	78.7	124.6
1,3,5-Trimethylbenzene		111.6	81.3	128.9
tert-Butylbenzene		101.2	80.7	128.9
1,2,4-Trimethylbenzene		110.5	81.4	130.8
sec-Butylbenzene		95.4	77.4	129.8
p-Isopropyltoluene		95.8	79.8	137.5
1,3-Dichlorobenzene		104.8	77.0	131.3
1,4-Dichlorobenzene		106.0	20.7	137.7
1,2-Dichlorobenzene		107.9	10.0	166.2
1,2,3-Trimethylbenzene		101.4	76.3	124.2
n-Butylbenzene		92.1	80.0	133.3
Hexachloroethane		107.7	23.8	138.1
1,2-Dibromo-3-chloropropane		105.5	21.2	189.4
1,2,4-Trichlorobenzene		114.8	27.4	143.4
1,2,3-Trichlorobenzene		115.1	75.4	131.4
Naphthalene		104.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF230906W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:20, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		100.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230906B7.LCSDW06B, Parent Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:44, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether	*	122.0	67.4	121.2	6.5	30.0
Acetone		121.9	29.9	161.5	0.5	30.0
Methyl iodide		114.7	68.8	116.4	9.5	30.0
Carbon disulfide		99.9	63.8	137.4	12.7	30.0
tert-Methyl butyl ether (MTBE)		110.3	73.2	122.4	5.3	30.0
Acrylonitrile		105.7	69.9	128.9	3.4	30.0
2-Butanone (MEK)		97.6	44.0	134.4	2.1	30.0
Dichlorodifluoromethane		82.7	10.0	222.8	11.6	30.0
Chloromethane		91.0	23.8	166.5	10.0	30.0
Vinyl chloride		90.4	43.5	149.1	10.6	30.0
Bromomethane		87.2	56.8	151.3	7.9	30.0
Chloroethane		87.8	53.4	149.4	9.3	30.0
Trichlorofluoromethane		83.9	59.7	151.8	10.9	30.0
1,1-Dichloroethene		93.3	69.6	139.4	11.5	30.0
Methylene chloride		110.2	73.3	121.1	7.9	30.0
trans-1,2-Dichloroethene		94.9	73.6	129.3	9.0	30.0
1,1-Dichloroethane		100.0	71.5	126.2	9.1	30.0
cis-1,2-Dichloroethene		104.7	76.6	122.1	8.4	30.0
Tetrahydrofuran		91.4	59.0	117.9	4.8	30.0
Chloroform		99.0	78.4	124.0	10.4	30.0
Bromochloromethane		114.8	78.2	120.8	6.8	30.0
1,1,1-Trichloroethane		92.8	79.4	130.9	10.3	30.0
4-Methyl-2-pentanone (MIBK)		101.1	71.6	125.2	1.0	30.0
2-Hexanone		102.3	55.4	136.9	0.1	30.0
Carbon tetrachloride		91.9	72.6	133.0	11.1	30.0
Benzene		96.6	79.9	124.9	11.1	30.0
1,2-Dichloroethane		90.1	76.0	126.3	7.8	30.0
Trichloroethene		94.3	79.7	124.2	11.1	30.0
1,2-Dichloropropane		101.1	78.6	126.4	9.5	30.0
Bromodichloromethane		101.6	80.4	128.2	9.0	30.0
Dibromomethane		116.8	76.9	122.1	6.9	30.0
cis-1,3-Dichloropropene		105.0	79.8	129.9	8.8	30.0
Toluene		94.7	79.8	124.5	10.4	30.0
trans-1,3-Dichloropropene		106.7	74.0	131.3	7.0	30.0
1,1,2-Trichloroethane		103.9	78.7	123.1	7.5	30.0
Tetrachloroethene		94.7	74.5	124.5	11.9	30.0
trans-1,4-Dichloro-2-butene		88.8	68.6	135.4	6.5	30.0
Dibromochloromethane		114.8	74.6	127.2	7.2	30.0
1,2-Dibromoethane		107.3	70.3	133.7	6.4	30.0
Chlorobenzene		101.0	79.2	122.7	11.1	30.0

Organics - Volatiles, Prep Batch ID: VF230906W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 230906B7.LCSDW06B, Parent Sample ID: 230906B7.LCSW06B

Run in Batch: 230906B7, Run Date: 09/06/2023 23:44, Prep Date: 09/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		108.6	80.3	128.2	10.1	30.0
Ethylbenzene		96.1	79.5	129.1	11.1	30.0
p,m-Xylene		95.9	79.4	132.2	11.3	30.0
o-Xylene		96.1	80.2	131.0	11.2	30.0
Styrene		101.7	69.5	126.7	11.7	30.0
Isopropylbenzene		93.5	74.4	121.5	13.4	30.0
Bromoform		115.6	69.4	128.0	7.4	30.0
1,1,2,2-Tetrachloroethane		103.1	79.8	126.3	4.7	30.0
1,2,3-Trichloropropane		100.6	78.3	138.8	7.2	30.0
n-Propylbenzene		93.0	82.0	130.7	11.7	30.0
Bromobenzene		110.2	78.7	124.6	9.8	30.0
1,3,5-Trimethylbenzene		98.3	81.3	128.9	12.7	30.0
tert-Butylbenzene		90.3	80.7	128.9	11.4	30.0
1,2,4-Trimethylbenzene		97.6	81.4	130.8	12.3	30.0
sec-Butylbenzene		85.6	77.4	129.8	10.9	30.0
p-Isopropyltoluene		85.6	79.8	137.5	11.3	30.0
1,3-Dichlorobenzene		94.8	77.0	131.3	10.0	30.0
1,4-Dichlorobenzene		96.8	20.7	137.7	9.1	30.0
1,2-Dichlorobenzene		98.9	10.0	166.2	8.8	30.0
1,2,3-Trimethylbenzene		91.6	76.3	124.2	10.2	30.0
n-Butylbenzene		83.5	80.0	133.3	9.7	30.0
Hexachloroethane		97.4	23.8	138.1	10.0	30.0
1,2-Dibromo-3-chloropropane		104.3	21.2	189.4	1.2	30.0
1,2,4-Trichlorobenzene		107.2	27.4	143.4	6.9	30.0
1,2,3-Trichlorobenzene		110.5	75.4	131.4	4.1	30.0
Naphthalene		101.5	32.9	135.8	2.8	30.0
2-Methylnaphthalene		103.1	25.5	165.5	3.1	30.0

Organics - Volatiles, Prep Batch ID: VS230907W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907A9.BLKS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 15:01, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.46	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 12:44, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907A9.LCSDS07X, Parent Sample ID: 230907A9.LCSS07A

Run in Batch: 230907A9, Run Date: 09/07/2023 13:52, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		103.4	70.0	130.0	1.8	30.0

Matrix Spike (MS)

Lab Sample ID: 230907A9.5282705M, Parent Sample ID: S52827.04

Run in Batch: 230907A9, Run Date: 09/07/2023 20:56, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.5	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907A9.5282706N, Parent Sample ID: 230907A9.5282705M

Run in Batch: 230907A9, Run Date: 09/07/2023 21:17, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		113.1	70.0	130.0	4.9	30.0

Organics - Volatiles, Prep Batch ID: VS230907W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.44	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		124.7	70.0	130.0	17.3	30.0

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		98.5	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		92.0	70.0	130.0	6.6	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VS230908W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.48	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		89.5	70.0	130.0	1.5	30.0

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.9	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.8	70.0	130.0	15.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S52830
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing GWS - 30171056.0470A Plant 2
Submitted: 08/30/2023 16:05 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 11.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.0470A
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
52830.01	8/29/23	1110	MW-22-157_082923	GW	3		3						X	X
.02	8/29/23	1220	MW-22-155_082923	GW	3		3						X	
.03	8/29/23	1345	MW-22-153_082923	GW	3		3						X	X
.04	8/29/23	1430	MW-22-156_082923	GW	3		3						X	X
.05	8/29/23	1545	MW-14-58R_082923	GW	3		3						X	X
.06	—	—	Trip blank		1		1							X
.07	8/29/23	—	Dup-06_082923	GW	3		3						X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Sampler: Donald Richmond / Arcadis	8/30/23	1605
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Young	8/30/23	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S52831.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S52831.01-S52831.13
Project: RACER Lansing GWS - 30171056 Plant 2
Collected Date(s): 08/29/2023 - 08/30/2023
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.0470B

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (13 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S52831.01	MW-16-78_082923	Groundwater	08/29/23 10:05
S52831.02	MW-16-78_082923 MS	Groundwater	08/29/23 10:05
S52831.03	MW-16-78_082923 MSD	Groundwater	08/29/23 10:05
S52831.04	MW-19-121_082923	Groundwater	08/29/23 11:25
S52831.05	MW-19-122_082923	Groundwater	08/29/23 12:25
S52831.06	MW-20-129_082923	Groundwater	08/29/23 13:25
S52831.07	TW-14-02_082923	Groundwater	08/29/23 14:50
S52831.08	MW-19-123_082923	Groundwater	08/29/23 16:00
S52831.09	MW-20-126_083023	Groundwater	08/30/23 10:50
S52831.10	MW-20-127_083023	Groundwater	08/30/23 12:30
S52831.11	PW-14-02_083023	Groundwater	08/30/23 13:40
S52831.12	TW-15-12_083023	Groundwater	08/30/23 14:40
S52831.13	DUP-05_083023	Groundwater	08/30/23 00:01

Analytical Laboratory Report

Lab Sample ID: S52831.01
Sample Tag: MW-16-78_082923
Collected Date/Time: 08/29/2023 10:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 16:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S52831.02
Sample Tag: MW-16-78_082923 MS
Collected Date/Time: 08/29/2023 10:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 18:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	46	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S52831.03
Sample Tag: MW-16-78_082923 MSD
Collected Date/Time: 08/29/2023 10:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 18:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	54	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S52831.04
Sample Tag: MW-19-121_082923
Collected Date/Time: 08/29/2023 11:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 06:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S52831.05
Sample Tag: MW-19-122_082923
Collected Date/Time: 08/29/2023 12:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 06:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Lab Sample ID: S52831.06
Sample Tag: MW-20-129_082923
Collected Date/Time: 08/29/2023 13:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 07:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	74	1		ug/L	1	123-91-1	

Lab Sample ID: S52831.07
Sample Tag: TW-14-02_082923
Collected Date/Time: 08/29/2023 14:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 17:14, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	220	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52831.08
Sample Tag: MW-19-123_082923
Collected Date/Time: 08/29/2023 16:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 09:52, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	72	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S52831.09
Sample Tag: MW-20-126_083023
Collected Date/Time: 08/30/2023 10:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 10:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	88	1		ug/L	1	123-91-1	

Lab Sample ID: S52831.10
Sample Tag: MW-20-127_083023
Collected Date/Time: 08/30/2023 12:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 17:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	180	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52831.11
Sample Tag: PW-14-02_083023
Collected Date/Time: 08/30/2023 13:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 16:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S52831.12
Sample Tag: TW-15-12_083023
Collected Date/Time: 08/30/2023 14:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 11:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S52831.13
Sample Tag: DUP-05_083023
Collected Date/Time: 08/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 11:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	91	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S52831.01(01)+QC01
Generated on 09/11/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S52831.01-S52831.13
Project: RACER Lansing GWS - 30171056 Plant 2
Submitted Date/Time: 08/30/2023 16:05
Sampled by: Unknown
P.O. #: 30171056.0470B

QC Report Sections

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Analysis Summary (Pages 20-32)
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Internal Standards per Lab Sample (Pages 36-46)
Internal Standards per QC Sample (Pages 47-48)
Batch QC Results (Pages 49-50)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S52831.01
Sample Tag: MW-16-78_082923
Collected Date/Time: 08/29/2023 10:05
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 16:11	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.02

Sample Tag: MW-16-78_082923 MS

Collected Date/Time: 08/29/2023 10:05

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 18:35	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.03
Sample Tag: MW-16-78_082923 MSD
Collected Date/Time: 08/29/2023 10:05
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 18:55	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.04

Sample Tag: MW-19-121_082923

Collected Date/Time: 08/29/2023 11:25

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 06:20	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.05

Sample Tag: MW-19-122_082923

Collected Date/Time: 08/29/2023 12:25

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 06:41	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.06
Sample Tag: MW-20-129_082923
Collected Date/Time: 08/29/2023 13:25
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 07:02	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.07
Sample Tag: TW-14-02_082923
Collected Date/Time: 08/29/2023 14:50
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 17:14	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.08

Sample Tag: MW-19-123_082923

Collected Date/Time: 08/29/2023 16:00

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 09:52	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.09

Sample Tag: MW-20-126_083023

Collected Date/Time: 08/30/2023 10:50

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 10:12	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.10

Sample Tag: MW-20-127_083023

Collected Date/Time: 08/30/2023 12:30

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 17:36	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.11
Sample Tag: PW-14-02_083023
Collected Date/Time: 08/30/2023 13:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 16:33	230908A9	VS230908W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.12

Sample Tag: TW-15-12_083023

Collected Date/Time: 08/30/2023 14:40

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 11:15	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S52831.13

Sample Tag: DUP-05_083023

Collected Date/Time: 08/30/2023 00:01

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/08/23 11:36	230907B9	VS230907W3	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230907W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52831.04	1,4-Dioxane	SW8260B - SIM	09/08/23 06:20	230907B9
S52831.05	1,4-Dioxane	SW8260B - SIM	09/08/23 06:41	230907B9
S52831.06	1,4-Dioxane	SW8260B - SIM	09/08/23 07:02	230907B9
S52831.08	1,4-Dioxane	SW8260B - SIM	09/08/23 09:52	230907B9
S52831.09	1,4-Dioxane	SW8260B - SIM	09/08/23 10:12	230907B9
S52831.12	1,4-Dioxane	SW8260B - SIM	09/08/23 11:15	230907B9
S52831.13	1,4-Dioxane	SW8260B - SIM	09/08/23 11:36	230907B9

Organics - Volatiles, Prep Batch ID: VS230908W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S52831.01	1,4-Dioxane	SW8260B - SIM	09/08/23 16:11	230908A9
S52831.02	1,4-Dioxane	SW8260B - SIM	09/08/23 18:35	230908A9
S52831.03	1,4-Dioxane	SW8260B - SIM	09/08/23 18:55	230908A9
S52831.07	1,4-Dioxane	SW8260B - SIM	09/08/23 17:14	230908A9
S52831.10	1,4-Dioxane	SW8260B - SIM	09/08/23 17:36	230908A9
S52831.11	1,4-Dioxane	SW8260B - SIM	09/08/23 16:33	230908A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230908W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.01

Sample Tag: MW-16-78_082923

Collected Date/Time: 08/29/2023 10:05

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230908A9, Run Date: 09/08/2023 16:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.04

Sample Tag: MW-19-121_082923

Collected Date/Time: 08/29/2023 11:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 06:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**109.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.05

Sample Tag: MW-19-122_082923

Collected Date/Time: 08/29/2023 12:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 06:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.06

Sample Tag: MW-20-129_082923

Collected Date/Time: 08/29/2023 13:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 07:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.07

Sample Tag: TW-14-02_082923

Collected Date/Time: 08/29/2023 14:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230908A9, Run Date: 09/08/2023 17:14, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.08

Sample Tag: MW-19-123_082923

Collected Date/Time: 08/29/2023 16:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 09:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.09

Sample Tag: MW-20-126_083023

Collected Date/Time: 08/30/2023 10:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 10:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.10

Sample Tag: MW-20-127_083023

Collected Date/Time: 08/30/2023 12:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230908A9, Run Date: 09/08/2023 17:36, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.11

Sample Tag: PW-14-02_083023

Collected Date/Time: 08/30/2023 13:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230908A9, Run Date: 09/08/2023 16:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**105.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.12

Sample Tag: TW-15-12_083023

Collected Date/Time: 08/30/2023 14:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 11:15, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**109.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S52831.13

Sample Tag: DUP-05_083023

Collected Date/Time: 08/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230907B9, Run Date: 09/08/2023 11:36, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230907W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.3**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS230908W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**79.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230907W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230907B9.BLKW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 04:15, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.44	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:06, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230907B9.LCSDW07B, Parent Sample ID: 230907B9.LCSW07B

Run in Batch: 230907B9, Run Date: 09/08/2023 01:27, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		124.7	70.0	130.0	17.3	30.0

Matrix Spike (MS)

Lab Sample ID: 230907B9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230907B9, Run Date: 09/08/2023 02:51, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		98.5	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230907B9.5283103N, Parent Sample ID: 230907B9.5283102M

Run in Batch: 230907B9, Run Date: 09/08/2023 03:12, Prep Date: 09/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		92.0	70.0	130.0	6.6	30.0

Organics - Volatiles, Prep Batch ID: VS230908W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 230908A9.BLKW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 15:51, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.48	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:28, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230908A9.LCSDW08A, Parent Sample ID: 230908A9.LCSW08A

Run in Batch: 230908A9, Run Date: 09/08/2023 14:49, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		89.5	70.0	130.0	1.5	30.0

Matrix Spike (MS)

Lab Sample ID: 230908A9.5283102M, Parent Sample ID: S52831.01

Run in Batch: 230908A9, Run Date: 09/08/2023 18:35, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.9	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 230908A9.5283103N, Parent Sample ID: 230908A9.5283102M

Run in Batch: 230908A9, Run Date: 09/08/2023 18:55, Prep Date: 09/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.8	70.0	130.0	15.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S52831
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing GWS - 30171056 Plant 2
Submitted: 08/30/2023 16:05 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 11.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056._____ SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Special Instructions
.01/.02/.03	8/29/23	10:05	MW-16-78_082923	GW	6		6						X		MS/MSD
52831.04	8/29/23	11:25	MW-19-121_082923	GW	3		3						X		
.05	8/29/23	12:25	MW-19-122_082923	GW	3		3						X		
.06	8/29/23	13:25	MW-20-129_082923	GW	3		3						X		
.07	8/29/23	14:50	~~MW-~~ TW-14-02_082923	GW	3		3						X		
.08	8/29/23	1600	MW-19-123_082923	GW	3		3						X		
.09	8/30/23	1050	MW-20-126_083023	GW	3		3						X		
.10	8/30/23	1230	MW-20-127_083023	GW	3		3						X		
.11	8/30/23	1340	PW-14-02_083023	GW	3		3						X		
.12	8/30/23	1440	TW-15-12_083023	GW	3		3						X		
.13	8/30/23	—	Dup-05_083023	GW	3		3						X		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE	TIME
Donald Richard/Arcadis		8/30/23	1605
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
Johanna Murray		8/30/23	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S51909.01(01)+QC01
Generated on 08/15/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S51909.01-S51909.04
Project: 30171056.0470B / RACER Lansing Plant 2
Collected Date(s): 08/07/2023
Submitted Date/Time: 08/08/2023 10:08
Sampled by: Robert Prigge
P.O. #: PO

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S51909.01	MW-19-122_080723	Groundwater	08/07/23 12:28
S51909.02	MW-20-129_080723	Groundwater	08/07/23 14:45
S51909.03	TW-14-02_080723	Groundwater	08/07/23 15:55
S51909.04	MW-19-123_080723	Groundwater	08/07/23 17:40

Analytical Laboratory Report

Lab Sample ID: S51909.01
Sample Tag: MW-19-122_080723
Collected Date/Time: 08/07/2023 12:28
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/15/23 11:07	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/14/23 21:08, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S51909.02
Sample Tag: MW-20-129_080723
Collected Date/Time: 08/07/2023 14:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/15/23 11:07	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/14/23 21:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Lab Sample ID: S51909.03
Sample Tag: TW-14-02_080723
Collected Date/Time: 08/07/2023 15:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/15/23 11:07	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/14/23 21:52, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	152	1		ug/L	1	123-91-1	

Lab Sample ID: S51909.04
Sample Tag: MW-19-123_080723
Collected Date/Time: 08/07/2023 17:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/15/23 11:07	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/14/23 22:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	53	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S51909.01(01)+QC01
Generated on 08/15/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S51909.01-S51909.04
Project: 30171056.0470B / RACER Lansing Plant 2
Submitted Date/Time: 08/08/2023 10:08
Sampled by: Robert Prigge
P.O. #: PO

QC Report Sections

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Analysis Summary (Pages 11-14)
Prep Batch Summary (Page 15)
Surrogates per QC Sample (Page 16)
Internal Standards per Lab Sample (Pages 17-20)
Internal Standards per QC Sample (Page 21)
Batch QC Results (Page 22)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S51909.01
Sample Tag: MW-19-122_080723
Collected Date/Time: 08/07/2023 12:28
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/14/23 21:08	230814B9	VS230814W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S51909.02
Sample Tag: MW-20-129_080723
Collected Date/Time: 08/07/2023 14:45
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/14/23 21:30	230814B9	VS230814W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S51909.03
Sample Tag: TW-14-02_080723
Collected Date/Time: 08/07/2023 15:55
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/14/23 21:52	230814B9	VS230814W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S51909.04
Sample Tag: MW-19-123_080723
Collected Date/Time: 08/07/2023 17:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/14/23 22:13	230814B9	VS230814W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS230814W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S51909.01	1,4-Dioxane	SW8260B - SIM	08/14/23 21:08	230814B9
S51909.02	1,4-Dioxane	SW8260B - SIM	08/14/23 21:30	230814B9
S51909.03	1,4-Dioxane	SW8260B - SIM	08/14/23 21:52	230814B9
S51909.04	1,4-Dioxane	SW8260B - SIM	08/14/23 22:13	230814B9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS230814W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230814B9.BLKW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 20:26, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 17:58, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230814B9.LCSDW14B, Parent Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 18:19, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S51909.01

Sample Tag: MW-19-122_080723

Collected Date/Time: 08/07/2023 12:28

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230814B9, Run Date: 08/14/2023 21:08, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**119.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S51909.02

Sample Tag: MW-20-129_080723

Collected Date/Time: 08/07/2023 14:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230814B9, Run Date: 08/14/2023 21:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**114.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S51909.03

Sample Tag: TW-14-02_080723

Collected Date/Time: 08/07/2023 15:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230814B9, Run Date: 08/14/2023 21:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**115.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S51909.04

Sample Tag: MW-19-123_080723

Collected Date/Time: 08/07/2023 17:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 230814B9, Run Date: 08/14/2023 22:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**111.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230814W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230814B9.BLKW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 20:26, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 17:58, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230814B9.LCSDW14B, Parent Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 18:19, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS230814W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 230814B9.BLKW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 20:26, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.25	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 17:58, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 230814B9.LCSDW14B, Parent Sample ID: 230814B9.LCSW14B

Run in Batch: 230814B9, Run Date: 08/14/2023 18:19, Prep Date: 08/14/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.5	70.0	130.0	0.4	30.0

Merit Laboratories Login Checklist

Lab Set ID: S51909
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing Plant 2
Submitted: 08/08/2023 10:08 Login User: PFD

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.5
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

ARCADIS
Infrastructure · Water · Environment · Buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order #

Send Results to:

Contact & Company Name: ARCADIS Tiffany Linder
Telephone: 810 225 1978
Address: 28550 Cabot Dr. STE 500
Fax:
City: Novi State: MI Zip: 48377
E-mail Address: tiffany.linder@arcadis.com
Project Name/Location (City, State): Pacer Lansing Plant 2
Project #: 30174056.0470B
Sampler's Printed Name: Robert Prigge
Sampler's Signature:

Preservative	HCl						
Filtered (✓)							
# of Containers	3						
Container Information	40mlVOA						

PARAMETER ANALYSIS & METHOD

1,4 dioxane 8260B SIM

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil
SE - Sediment
NL - NAPL/Oil
W - Water
SL - Sludge
SW - Sample Wipe
T - Tissue
A - Air
Other: _____

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix		REMARKS
MW-14-172_080723	08/07/23	1238		X	GW	3	51904.01
MW-20-179_080723	08/07/23	1445		X	GW	3	.02
TW-14-02_080723	08/07/23	1555		X	GW	3	.03
MW-14-173_080723	08/07/23	1746		X	GW	3	.04

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Merit Labs	Cooler Custody Seal (✓)	Printed Name: Robert Prigge	Printed Name:	Printed Name:	Printed Name:
☒ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature: Johanna Murray	Signature:	Signature:
Specify Turnaround Requirements: Standard	Sample Receipt:	Firm: ARCADIS	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #: —	Condition/Cooler Temp: 5.5	Date/Time: 8/8/23	Date/Time: 8/8/23 1008	Date/Time:	Date/Time:

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YH29013**

Date Completed:09/11/2023

09/12/2023 9:09 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YH29013

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18, PFAS by Isotope Dilution SOP.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Surrogate recovery for the following samples was outside the upper control limit: YH29013-002, YH29013-005, YH29013-006, YH29013-009, YH29013-010, YH29013-013, YH29013-014. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The method blank for prep batch 83827 contained analyte: 6:2 FTS greater than the acceptance criteria. The associated samples, YH29012-002, YH29013-003, YH29013-004, did not contain detections for the target analyte >1/2 LOQ; therefore, re-extraction and/or re-analysis of samples was not performed. The data has been reported.

Sample Summary
Arcadis U.S., Inc.
Lot Number: YH29013
Project Name: RACER Lansing GWS
Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	EB-01_082823	Aqueous	08/28/2023 1200	08/29/2023
002	MW-22-143_082823	Aqueous	08/28/2023 1245	08/29/2023
003	MW-22-158_082823	Aqueous	08/28/2023 1400	08/29/2023
004	MW-22-145_082823	Aqueous	08/28/2023 1510	08/29/2023
005	MW-22-144_082823	Aqueous	08/28/2023 1600	08/29/2023
006	MW-22-146_082823	Aqueous	08/28/2023 1655	08/29/2023
007	MW-22-160_082823	Aqueous	08/28/2023 1745	08/29/2023
008	Dup-02_082823	Aqueous	08/28/2023	08/29/2023
009	Dup-01_082823	Aqueous	08/28/2023	08/29/2023
010	MW-22-147_082823	Aqueous	08/28/2023 1305	08/29/2023
011	MW-22-148_082823	Aqueous	08/28/2023 1350	08/29/2023
012	MW-22-149_082823	Aqueous	08/28/2023 1450	08/29/2023
013	MW-22-150_082823	Aqueous	08/28/2023 1550	08/29/2023
014	MW-22-151_082823	Aqueous	08/28/2023 1645	08/29/2023
015	MW-22-152_082823	Aqueous	08/28/2023 1740	08/29/2023
016	EB-02_082823	Aqueous	08/28/2023 1800	08/29/2023

(16 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YH29013

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	MW-22-143_082823	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	9
002	MW-22-143_082823	Aqueous	PFBA	PFAS by ID	10		ng/L	9
002	MW-22-143_082823	Aqueous	PFHpA	PFAS by ID	6.6		ng/L	9
002	MW-22-143_082823	Aqueous	PFHxA	PFAS by ID	14		ng/L	9
002	MW-22-143_082823	Aqueous	PFOA	PFAS by ID	6.5		ng/L	9
002	MW-22-143_082823	Aqueous	PFPeA	PFAS by ID	11		ng/L	9
003	MW-22-158_082823	Aqueous	6:2 FTS	PFAS by ID	3.5	BJ	ng/L	11
003	MW-22-158_082823	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	11
003	MW-22-158_082823	Aqueous	PFBA	PFAS by ID	5.1		ng/L	11
003	MW-22-158_082823	Aqueous	PFHpA	PFAS by ID	1.1	J	ng/L	11
003	MW-22-158_082823	Aqueous	PFHxA	PFAS by ID	2.5	J	ng/L	11
003	MW-22-158_082823	Aqueous	PFOA	PFAS by ID	1.0	J	ng/L	11
003	MW-22-158_082823	Aqueous	PFPeA	PFAS by ID	2.9	J	ng/L	11
004	MW-22-145_082823	Aqueous	6:2 FTS	PFAS by ID	3.1	BJ	ng/L	13
004	MW-22-145_082823	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	13
004	MW-22-145_082823	Aqueous	PFHxS	PFAS by ID	3.1	J	ng/L	13
004	MW-22-145_082823	Aqueous	PFBA	PFAS by ID	7.9		ng/L	13
004	MW-22-145_082823	Aqueous	PFHpA	PFAS by ID	9.9		ng/L	13
004	MW-22-145_082823	Aqueous	PFHxA	PFAS by ID	19		ng/L	13
004	MW-22-145_082823	Aqueous	PFOA	PFAS by ID	19		ng/L	13
004	MW-22-145_082823	Aqueous	PFPeA	PFAS by ID	18		ng/L	13
005	MW-22-144_082823	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	15
005	MW-22-144_082823	Aqueous	PFHxS	PFAS by ID	4.7		ng/L	15
005	MW-22-144_082823	Aqueous	PFBA	PFAS by ID	4.1		ng/L	15
005	MW-22-144_082823	Aqueous	PFHpA	PFAS by ID	3.9		ng/L	15
005	MW-22-144_082823	Aqueous	PFHxA	PFAS by ID	8.0		ng/L	15
005	MW-22-144_082823	Aqueous	PFOA	PFAS by ID	7.5		ng/L	15
005	MW-22-144_082823	Aqueous	PFPeA	PFAS by ID	7.4		ng/L	15
006	MW-22-146_082823	Aqueous	PFBS	PFAS by ID	2.9	J	ng/L	17
006	MW-22-146_082823	Aqueous	PFHxS	PFAS by ID	0.95	J	ng/L	17
006	MW-22-146_082823	Aqueous	PFBA	PFAS by ID	6.7		ng/L	17
006	MW-22-146_082823	Aqueous	PFHxA	PFAS by ID	0.95	J	ng/L	17
006	MW-22-146_082823	Aqueous	PFOA	PFAS by ID	1.8	J	ng/L	17
006	MW-22-146_082823	Aqueous	PFPeA	PFAS by ID	0.71	J	ng/L	17
006	MW-22-146_082823	Aqueous	PFOS	PFAS by ID	2.7	J	ng/L	17
007	MW-22-160_082823	Aqueous	PFBA	PFAS by ID	1.0	J	ng/L	19
008	Dup-02_082823	Aqueous	PFPeA	PFAS by ID	0.52	J	ng/L	21
009	Dup-01_082823	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	23
009	Dup-01_082823	Aqueous	PFBA	PFAS by ID	10		ng/L	23
009	Dup-01_082823	Aqueous	PFHpA	PFAS by ID	6.2		ng/L	23
009	Dup-01_082823	Aqueous	PFHxA	PFAS by ID	15		ng/L	23
009	Dup-01_082823	Aqueous	PFOA	PFAS by ID	6.3		ng/L	23
009	Dup-01_082823	Aqueous	PFPeA	PFAS by ID	11		ng/L	23

Detection Summary (Continued)

Lot Number: YH29013

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
010	MW-22-147_082823	Aqueous	PFBS	PFAS by ID	2.9	J	ng/L	25
010	MW-22-147_082823	Aqueous	PFHxS	PFAS by ID	2.6	J	ng/L	25
010	MW-22-147_082823	Aqueous	PFBA	PFAS by ID	7.2		ng/L	25
010	MW-22-147_082823	Aqueous	PFHpA	PFAS by ID	1.0	J	ng/L	25
010	MW-22-147_082823	Aqueous	PFHxA	PFAS by ID	2.4	J	ng/L	25
010	MW-22-147_082823	Aqueous	PFOA	PFAS by ID	4.6		ng/L	25
010	MW-22-147_082823	Aqueous	PFPeA	PFAS by ID	2.5	J	ng/L	25
010	MW-22-147_082823	Aqueous	PFOS	PFAS by ID	2.5	J	ng/L	25
011	MW-22-148_082823	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	27
011	MW-22-148_082823	Aqueous	PFBA	PFAS by ID	1.4	J	ng/L	27
012	MW-22-149_082823	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFHxS	PFAS by ID	0.93	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFBA	PFAS by ID	0.73	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFHpA	PFAS by ID	0.53	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFNA	PFAS by ID	0.95	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFOA	PFAS by ID	1.6	J	ng/L	29
012	MW-22-149_082823	Aqueous	PFOS	PFAS by ID	2.3	J	ng/L	29
013	MW-22-150_082823	Aqueous	PFBA	PFAS by ID	2.5	J	ng/L	31
013	MW-22-150_082823	Aqueous	PFPeA	PFAS by ID	1.3	J	ng/L	31
014	MW-22-151_082823	Aqueous	PFBS	PFAS by ID	8.9		ng/L	33
014	MW-22-151_082823	Aqueous	PFHxS	PFAS by ID	3.0	J	ng/L	33
014	MW-22-151_082823	Aqueous	PFBA	PFAS by ID	9.5		ng/L	33
014	MW-22-151_082823	Aqueous	PFHpA	PFAS by ID	3.3	J	ng/L	33
014	MW-22-151_082823	Aqueous	PFHxA	PFAS by ID	7.0		ng/L	33
014	MW-22-151_082823	Aqueous	PFNA	PFAS by ID	0.59	J	ng/L	33
014	MW-22-151_082823	Aqueous	PFOA	PFAS by ID	8.0		ng/L	33
014	MW-22-151_082823	Aqueous	PFPeA	PFAS by ID	13		ng/L	33
014	MW-22-151_082823	Aqueous	PFOS	PFAS by ID	4.9		ng/L	33
015	MW-22-152_082823	Aqueous	PFBS	PFAS by ID	14		ng/L	35
015	MW-22-152_082823	Aqueous	PFHxS	PFAS by ID	3.9		ng/L	35
015	MW-22-152_082823	Aqueous	PFBA	PFAS by ID	5.2		ng/L	35
015	MW-22-152_082823	Aqueous	PFHpA	PFAS by ID	1.5	J	ng/L	35
015	MW-22-152_082823	Aqueous	PFHxA	PFAS by ID	3.1	J	ng/L	35
015	MW-22-152_082823	Aqueous	PFOA	PFAS by ID	5.5		ng/L	35
015	MW-22-152_082823	Aqueous	PFPeA	PFAS by ID	4.1		ng/L	35
015	MW-22-152_082823	Aqueous	PFOS	PFAS by ID	2.7	J	ng/L	35

(79 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-001**

Description: **EB-01_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP	1	09/07/2023 2340	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.79	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.55	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.41	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.63	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150
13C2_6:2FTS		123	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		111	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **YH29013-001**
Description: **EB-01_082823**		Matrix: **Aqueous**
Date Sampled: **08/28/2023 1200**	Project Name: **RACER Lansing GWS**	
Date Received: **08/29/2023**	Project Number: **30171056**	

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-002**

Description: **MW-22-143_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 1927	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/07/2023 2351	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.6**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**14**		**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.5**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**11**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	169	25-150	N	195	25-150
13C2_6:2FTS		129	25-150		135	25-150
13C2_8:2FTS		105	25-150		93	25-150
13C2_PFDoA		89	25-150		94	25-150
13C2_PFTeDA		92	25-150		94	25-150
13C3_PFBS		97	25-150		97	25-150
13C3_PFHxS		98	25-150		97	25-150
13C3-HFPO-DA		96	25-150		98	25-150
13C4_PFBA		66	25-150		61	25-150
13C4_PFHpA		95	25-150		99	25-150
13C5_PFHxA		102	25-150		101	25-150
13C5_PFPeA		99	25-150		91	25-150
13C6_PFDA		91	25-150		87	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-002**

Description: **MW-22-143_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	25-150		98	25-150
13C8_PFOA		97	25-150		101	25-150
13C8_PFOS		91	25-150		93	25-150
13C8_PFOSA		102	10-150		96	10-150
13C9_PFNA		96	25-150		110	25-150
d5-EtFOSAA		98	25-150		97	25-150
d3-MeFOSAA		97	25-150		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-003**

Description: **MW-22-158_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 1938	ARC2	08/31/2023 1858	83827

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**3.5**	**BJ**	**7.5**	**1.9**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.88	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.8**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.67	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.58	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.56	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.8	0.52	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.1**		**3.8**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.8	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.1**	**J**	**3.8**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.8**	**0.65**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.8	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.0**	**J**	**3.8**	**0.78**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**	**J**	**3.8**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.59	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.8	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		144	25-150
13C2_6:2FTS		131	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		88	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		68	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-003**

Description: **MW-22-158_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-004**

Description: **MW-22-145_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 1949	ARC2	08/31/2023 1858	83827

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**3.1**	**BJ**	**6.8**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.9**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.9**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		75	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-004**

Description: **MW-22-145_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-005**

Description: **MW-22-144_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1600** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2022	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0001	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.7**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.1**		**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.9**		**3.7**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.0**		**3.7**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**7.5**		**3.7**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.4**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	184	25-150	N	153	25-150
13C2_6:2FTS		149	25-150		111	25-150
13C2_8:2FTS		118	25-150		94	25-150
13C2_PFDoA		101	25-150		93	25-150
13C2_PFTeDA		103	25-150		92	25-150
13C3_PFBS		110	25-150		92	25-150
13C3_PFHxS		112	25-150		88	25-150
13C3-HFPO-DA		107	25-150		96	25-150
13C4_PFBA		78	25-150		69	25-150
13C4_PFHpA		110	25-150		97	25-150
13C5_PFHxA		113	25-150		100	25-150
13C5_PFPeA		119	25-150		96	25-150
13C6_PFDA		118	25-150		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-005**

Description: **MW-22-144_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1600** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		109	25-150		97	25-150
13C8_PFOA		111	25-150		96	25-150
13C8_PFOS		104	25-150		93	25-150
13C8_PFOSA		110	10-150		100	10-150
13C9_PFNA		108	25-150		102	25-150
d5-EtFOSAA		108	25-150		91	25-150
d3-MeFOSAA		105	25-150		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-006**

Description: **MW-22-146_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1655** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2033	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0012	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.7**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.71**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	178	25-150	N	214	25-150
13C2_6:2FTS		139	25-150		144	25-150
13C2_8:2FTS		115	25-150		107	25-150
13C2_PFDoA		90	25-150		103	25-150
13C2_PFTeDA		94	25-150		103	25-150
13C3_PFBS		99	25-150		106	25-150
13C3_PFHxS		106	25-150		105	25-150
13C3-HFPO-DA		97	25-150		115	25-150
13C4_PFBA		66	25-150		67	25-150
13C4_PFHpA		97	25-150		112	25-150
13C5_PFHxA		104	25-150		113	25-150
13C5_PFPeA		99	25-150		103	25-150
13C6_PFDA		105	25-150		114	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-006**

Description: **MW-22-146_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1655** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		95	25-150		109	25-150
13C8_PFOA		112	25-150		108	25-150
13C8_PFOS		87	25-150		107	25-150
13C8_PFOSA		104	10-150		113	10-150
13C9_PFNA		98	25-150		118	25-150
d5-EtFOSAA		94	25-150		108	25-150
d3-MeFOSAA		94	25-150		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-007**

Description: **MW-22-160_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1745** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2044	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0023	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.0**	**J**	**3.7**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.63	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.76	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		125	25-150	N	155	25-150
13C2_6:2FTS		122	25-150		116	25-150
13C2_8:2FTS		105	25-150		96	25-150
13C2_PFDoA		89	25-150		100	25-150
13C2_PFTeDA		90	25-150		93	25-150
13C3_PFBS		96	25-150		105	25-150
13C3_PFHxS		104	25-150		95	25-150
13C3-HFPO-DA		93	25-150		113	25-150
13C4_PFBA		72	25-150		67	25-150
13C4_PFHpA		94	25-150		103	25-150
13C5_PFHxA		92	25-150		108	25-150
13C5_PFPeA		99	25-150		105	25-150
13C6_PFDA		94	25-150		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-007**

Description: **MW-22-160_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1745** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		94	25-150		102	25-150
13C8_PFOA		97	25-150		106	25-150
13C8_PFOS		93	25-150		97	25-150
13C8_PFOSA		95	10-150		107	10-150
13C9_PFNA		96	25-150		111	25-150
d5-EtFOSAA		90	25-150		106	25-150
d3-MeFOSAA		94	25-150		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-008**

Description: **Dup-02_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0033	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.61	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.52**	**J**	**3.5**	**0.47**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		147	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		101	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		113	25-150
13C4_PFBA		70	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		101	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-008**

Description: **Dup-02_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		103	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-009**

Description: **Dup-01_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2128	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0044	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.2**		**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.3**		**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**11**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	191	25-150	N	219	25-150
13C2_6:2FTS		136	25-150		129	25-150
13C2_8:2FTS		104	25-150		97	25-150
13C2_PFDoA		95	25-150		92	25-150
13C2_PFTeDA		97	25-150		90	25-150
13C3_PFBS		99	25-150		91	25-150
13C3_PFHxS		96	25-150		96	25-150
13C3-HFPO-DA		101	25-150		99	25-150
13C4_PFBA		68	25-150		60	25-150
13C4_PFHpA		98	25-150		100	25-150
13C5_PFHxA		96	25-150		101	25-150
13C5_PFPeA		102	25-150		93	25-150
13C6_PFDA		100	25-150		90	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-009**

Description: **Dup-01_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		94	25-150		100	25-150
13C8_PFOA		103	25-150		108	25-150
13C8_PFOS		101	25-150		94	25-150
13C8_PFOSA		103	10-150		99	10-150
13C9_PFNA		101	25-150		102	25-150
d5-EtFOSAA		98	25-150		95	25-150
d3-MeFOSAA		99	25-150		91	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-010**

Description: **MW-22-147_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1305** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2139	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0116	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.2**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.0**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.4**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	162	25-150	N	217	25-150
13C2_6:2FTS		117	25-150		112	25-150
13C2_8:2FTS		81	25-150		82	25-150
13C2_PFDoA		69	25-150		80	25-150
13C2_PFTeDA		67	25-150		77	25-150
13C3_PFBS		76	25-150		79	25-150
13C3_PFHxS		74	25-150		79	25-150
13C3-HFPO-DA		74	25-150		79	25-150
13C4_PFBA		51	25-150		49	25-150
13C4_PFHpA		70	25-150		83	25-150
13C5_PFHxA		78	25-150		84	25-150
13C5_PFPeA		72	25-150		78	25-150
13C6_PFDA		77	25-150		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-010**

Description: **MW-22-147_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1305** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		75	25-150		87	25-150
13C8_PFOA		78	25-150		82	25-150
13C8_PFOS		69	25-150		82	25-150
13C8_PFOSA		78	10-150		93	10-150
13C9_PFNA		79	25-150		88	25-150
d5-EtFOSAA		75	25-150		82	25-150
d3-MeFOSAA		74	25-150		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-011**

Description: **MW-22-148_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1350** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0126	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.35**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.51**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		135	25-150
13C2_6:2FTS		134	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		117	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		102	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-011**

Description: **MW-22-148_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1350** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		105	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-012**

Description: **MW-22-149_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1450** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0137	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.6**	**0.37**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.44	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.93**	**J**	**3.6**	**0.49**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.73**	**J**	**3.6**	**0.54**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.53**	**J**	**3.6**	**0.40**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.61	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.95**	**J**	**3.6**	**0.41**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.6**	**J**	**3.6**	**0.74**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.3**	**J**	**3.6**	**1.8**	**ng/L**	**2**

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		128	25-150
13C2_6:2FTS		118	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		110	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		100	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-012**

Description: **MW-22-149_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1450** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		105	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-013**

Description: **MW-22-150_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2212	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0148	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.3**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	250	25-150	N	284	25-150
13C2_6:2FTS	N	166	25-150	N	189	25-150
13C2_8:2FTS		103	25-150		93	25-150
13C2_PFDoA		87	25-150		86	25-150
13C2_PFTeDA		90	25-150		88	25-150
13C3_PFBS		84	25-150		82	25-150
13C3_PFHxS		93	25-150		85	25-150
13C3-HFPO-DA		78	25-150		72	25-150
13C4_PFBA		39	25-150		36	25-150
13C4_PFHpA		81	25-150		84	25-150
13C5_PFHxA		82	25-150		84	25-150
13C5_PFPeA		67	25-150		64	25-150
13C6_PFDA		96	25-150		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-013**

Description: **MW-22-150_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	25-150		94	25-150
13C8_PFOA		97	25-150		95	25-150
13C8_PFOS		91	25-150		89	25-150
13C8_PFOSA		98	10-150		94	10-150
13C9_PFNA		101	25-150		101	25-150
d5-EtFOSAA		89	25-150		95	25-150
d3-MeFOSAA		94	25-150		89	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-014**

Description: **MW-22-151_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2223	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0158	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.0**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.5**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.3**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.0**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.59**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.0**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.9**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	256	25-150	N	300	25-150
13C2_6:2FTS	N	247	25-150	N	266	25-150
13C2_8:2FTS	N	192	25-150	N	166	25-150
13C2_PFDoA		99	25-150		96	25-150
13C2_PFTeDA		94	25-150		88	25-150
13C3_PFBS		87	25-150		86	25-150
13C3_PFHxS		104	25-150		90	25-150
13C3-HFPO-DA		72	25-150		71	25-150
13C4_PFBA		37	25-150		35	25-150
13C4_PFHpA		77	25-150		86	25-150
13C5_PFHxA		80	25-150		77	25-150
13C5_PFPeA		63	25-150		64	25-150
13C6_PFDA		109	25-150		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-014**

Description: **MW-22-151_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		105	25-150		105	25-150
13C8_PFOA		92	25-150		96	25-150
13C8_PFOS		100	25-150		87	25-150
13C8_PFOSA		99	10-150		95	10-150
13C9_PFNA		111	25-150		113	25-150
d5-EtFOSAA		111	25-150		109	25-150
d3-MeFOSAA		123	25-150		109	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-015**

Description: **MW-22-152_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1740** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/01/2023 2234	ARC2	08/31/2023 1858	83827
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0209	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**14**		**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.9**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.2**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.5**	**J**	**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.5**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.1**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		139	25-150	N	197	25-150
13C2_6:2FTS		106	25-150		139	25-150
13C2_8:2FTS		92	25-150		96	25-150
13C2_PFDoA		77	25-150		93	25-150
13C2_PFTeDA		76	25-150		86	25-150
13C3_PFBS		81	25-150		98	25-150
13C3_PFHxS		84	25-150		91	25-150
13C3-HFPO-DA		81	25-150		100	25-150
13C4_PFBA		66	25-150		66	25-150
13C4_PFHpA		79	25-150		96	25-150
13C5_PFHxA		87	25-150		106	25-150
13C5_PFPeA		83	25-150		91	25-150
13C6_PFDA		77	25-150		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-015**

Description: **MW-22-152_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1740** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		74	25-150		98	25-150
13C8_PFOA		82	25-150		98	25-150
13C8_PFOS		77	25-150		96	25-150
13C8_PFOSA		81	10-150		102	10-150
13C9_PFNA		81	25-150		105	25-150
d5-EtFOSAA		83	25-150		92	25-150
d3-MeFOSAA		81	25-150		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-016**

Description: **EB-02_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1800** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP	1	09/08/2023 0219	MMM	09/06/2023 2025	84190

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		97	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		102	25-150
13C4_PFBA		91	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		94	25-150
13C7_PFUdA		98	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YH29013-016**

Description: **EB-02_082823** Matrix: **Aqueous**

Date Sampled: **08/28/2023 1800** Project Name: **RACER Lansing GWS**

Date Received: **08/29/2023** Project Number: **30171056**

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ83827-001
Batch: 83827
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	09/01/2023 1759
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	09/01/2023 1759
8:2 FTS	ND		1	8.0	1.6	ng/L	09/01/2023 1759
6:2 FTS	**4.7**	**J**	**1**	**8.0**	**2.0**	**ng/L**	**09/01/2023 1759**
4:2 FTS	ND		1	8.0	0.87	ng/L	09/01/2023 1759
GenX	ND		1	8.0	2.1	ng/L	09/01/2023 1759
ADONA	ND		1	8.0	0.48	ng/L	09/01/2023 1759
EtFOSAA	ND		1	8.0	0.75	ng/L	09/01/2023 1759
MeFOSAA	ND		1	8.0	0.93	ng/L	09/01/2023 1759
PFBS	ND		1	4.0	0.41	ng/L	09/01/2023 1759
PFDS	ND		1	4.0	0.78	ng/L	09/01/2023 1759
PFHpS	ND		1	4.0	0.50	ng/L	09/01/2023 1759
PFNS	ND		1	4.0	0.71	ng/L	09/01/2023 1759
PFOSA	ND		1	4.0	0.61	ng/L	09/01/2023 1759
PFPeS	ND		1	4.0	0.59	ng/L	09/01/2023 1759
PFHxS	ND		1	4.0	0.55	ng/L	09/01/2023 1759
PFBA	ND		1	4.0	0.60	ng/L	09/01/2023 1759
PFDA	ND		1	4.0	0.52	ng/L	09/01/2023 1759
PFDoA	ND		1	4.0	0.47	ng/L	09/01/2023 1759
PFHpA	ND		1	4.0	0.45	ng/L	09/01/2023 1759
PFHxA	ND		1	4.0	0.69	ng/L	09/01/2023 1759
PFNA	ND		1	4.0	0.46	ng/L	09/01/2023 1759
PFOA	ND		1	4.0	0.83	ng/L	09/01/2023 1759
PFPeA	ND		1	4.0	0.54	ng/L	09/01/2023 1759
PFTeDA	ND		1	4.0	0.60	ng/L	09/01/2023 1759
PFTrDA	ND		1	4.0	0.53	ng/L	09/01/2023 1759
PFUdA	ND		1	4.0	0.63	ng/L	09/01/2023 1759
PFOS	ND		1	4.0	2.0	ng/L	09/01/2023 1759

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		113	25-150
13C2_PFDoA		108	25-150
13C2_PFTeDA		110	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ83827-001
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		99	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		110	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ83827-002
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	13		1	88	50-150	09/01/2023 1810
11Cl-PF3OUdS	15	14		1	93	50-150	09/01/2023 1810
8:2 FTS	15	17		1	109	50-150	09/01/2023 1810
6:2 FTS	15	22		1	148	50-150	09/01/2023 1810
4:2 FTS	15	16		1	109	50-150	09/01/2023 1810
GenX	32	33		1	103	50-150	09/01/2023 1810
ADONA	15	15		1	101	50-150	09/01/2023 1810
EtFOSAA	16	16		1	98	50-150	09/01/2023 1810
MeFOSAA	16	18		1	113	50-150	09/01/2023 1810
PFBS	14	14		1	101	50-150	09/01/2023 1810
PFDS	15	15		1	96	50-150	09/01/2023 1810
PFHpS	15	15		1	98	50-150	09/01/2023 1810
PFNS	15	14		1	94	50-150	09/01/2023 1810
PFOSA	16	17		1	105	50-150	09/01/2023 1810
PFPeS	15	15		1	100	50-150	09/01/2023 1810
PFHxS	15	13		1	88	50-150	09/01/2023 1810
PFBA	16	16		1	101	50-150	09/01/2023 1810
PFDA	16	18		1	110	50-150	09/01/2023 1810
PFDoA	16	17		1	104	50-150	09/01/2023 1810
PFHpA	16	15		1	91	50-150	09/01/2023 1810
PFHxA	16	16		1	100	50-150	09/01/2023 1810
PFNA	16	15		1	96	50-150	09/01/2023 1810
PFOA	16	15		1	95	50-150	09/01/2023 1810
PFPeA	16	16		1	101	50-150	09/01/2023 1810
PFTeDA	16	16		1	101	50-150	09/01/2023 1810
PFTrDA	16	16		1	103	50-150	09/01/2023 1810
PFUdA	16	16		1	100	50-150	09/01/2023 1810
PFOS	15	13		1	88	50-150	09/01/2023 1810

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ83827-002
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		95	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		107	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YH29013-004MS
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	13		1	95	50-150	09/01/2023 2000
11Cl-PF3OUdS	ND	14	12		1	87	50-150	09/01/2023 2000
8:2 FTS	ND	14	14		1	100	50-150	09/01/2023 2000
6:2 FTS	3.1	14	18		1	104	50-150	09/01/2023 2000
4:2 FTS	ND	14	13		1	97	50-150	09/01/2023 2000
GenX	ND	29	30		1	102	50-150	09/01/2023 2000
ADONA	ND	14	15		1	107	50-150	09/01/2023 2000
EtFOSAA	ND	15	16		1	107	50-150	09/01/2023 2000
MeFOSAA	ND	15	17		1	115	50-150	09/01/2023 2000
PFBS	1.9	13	14		1	93	50-150	09/01/2023 2000
PFDS	ND	14	14		1	97	50-150	09/01/2023 2000
PFHpS	ND	14	15		1	110	50-150	09/01/2023 2000
PFNS	ND	14	12		1	89	50-150	09/01/2023 2000
PFOSA	ND	15	16		1	107	50-150	09/01/2023 2000
PFPeS	ND	14	13		1	97	50-150	09/01/2023 2000
PFHxS	3.1	13	17		1	103	50-150	09/01/2023 2000
PFBA	7.9	15	22		1	99	50-150	09/01/2023 2000
PFDA	ND	15	15		1	104	50-150	09/01/2023 2000
PFDoA	ND	15	15		1	101	50-150	09/01/2023 2000
PFHpA	9.9	15	25		1	101	50-150	09/01/2023 2000
PFHxA	19	15	33		1	97	50-150	09/01/2023 2000
PFNA	ND	15	15		1	100	50-150	09/01/2023 2000
PFOA	19	15	36		1	115	50-150	09/01/2023 2000
PFPeA	18	15	33		1	101	50-150	09/01/2023 2000
PFTeDA	ND	15	15		1	100	50-150	09/01/2023 2000
PFTrDA	ND	15	15		1	100	50-150	09/01/2023 2000
PFUdA	ND	15	15		1	104	50-150	09/01/2023 2000
PFOS	ND	14	14		1	102	50-150	09/01/2023 2000

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		115	25-150
13C2_6:2FTS		117	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YH29013-004MS
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		90	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YH29013-004MD
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	90	8.4	50-150	30	09/01/2023 2011
11Cl-PF3OUdS	ND	13	11		1	86	4.2	50-150	30	09/01/2023 2011
8:2 FTS	ND	14	16		1	120	15	50-150	30	09/01/2023 2011
6:2 FTS	3.1	13	19		1	121	9.8	50-150	30	09/01/2023 2011
4:2 FTS	ND	13	15		1	110	9.7	50-150	30	09/01/2023 2011
GenX	ND	28	28		1	99	6.5	50-150	30	09/01/2023 2011
ADONA	ND	13	13		1	98	11	50-150	30	09/01/2023 2011
EtFOSAA	ND	14	15		1	104	6.1	50-150	30	09/01/2023 2011
MeFOSAA	ND	14	14		1	101	16	50-150	30	09/01/2023 2011
PFBS	1.9	13	14		1	99	2.5	50-150	30	09/01/2023 2011
PFDS	ND	14	13		1	92	8.4	50-150	30	09/01/2023 2011
PFHpS	ND	14	14		1	102	10	50-150	30	09/01/2023 2011
PFNS	ND	14	13		1	94	2.6	50-150	30	09/01/2023 2011
PFOSA	ND	14	15		1	103	6.4	50-150	30	09/01/2023 2011
PFPeS	ND	13	13		1	97	3.2	50-150	30	09/01/2023 2011
PFHxS	3.1	13	16		1	101	3.3	50-150	30	09/01/2023 2011
PFBA	7.9	14	22		1	100	0.77	50-150	30	09/01/2023 2011
PFDA	ND	14	14		1	99	7.7	50-150	30	09/01/2023 2011
PFDoA	ND	14	15		1	103	0.91	50-150	30	09/01/2023 2011
PFHpA	9.9	14	24		1	100	1.8	50-150	30	09/01/2023 2011
PFHxA	19	14	33		1	100	0.083	50-150	30	09/01/2023 2011
PFNA	ND	14	14		1	102	0.84	50-150	30	09/01/2023 2011
PFOA	19	14	36		1	117	0.27	50-150	30	09/01/2023 2011
PFPeA	18	14	32		1	96	3.6	50-150	30	09/01/2023 2011
PFTeDA	ND	14	14		1	102	0.90	50-150	30	09/01/2023 2011
PFTrDA	ND	14	14		1	97	5.9	50-150	30	09/01/2023 2011
PFUdA	ND	14	15		1	103	4.3	50-150	30	09/01/2023 2011
PFOS	ND	13	16		1	118	12	50-150	30	09/01/2023 2011

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		122	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YH29013-004MD
Batch: 83827
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/31/2023 1858

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		92	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ84190-001
Batch: 84190
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/06/2023 2025

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	09/07/2023 2247
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	09/07/2023 2247
8:2 FTS	ND		1	8.0	1.6	ng/L	09/07/2023 2247
6:2 FTS	ND		1	8.0	2.0	ng/L	09/07/2023 2247
4:2 FTS	ND		1	8.0	0.87	ng/L	09/07/2023 2247
GenX	ND		1	8.0	2.1	ng/L	09/07/2023 2247
ADONA	ND		1	8.0	0.48	ng/L	09/07/2023 2247
EtFOSAA	ND		1	8.0	0.75	ng/L	09/07/2023 2247
MeFOSAA	ND		1	8.0	0.93	ng/L	09/07/2023 2247
PFBS	ND		1	4.0	0.41	ng/L	09/07/2023 2247
PFDS	ND		1	4.0	0.78	ng/L	09/07/2023 2247
PFHpS	ND		1	4.0	0.50	ng/L	09/07/2023 2247
PFNS	ND		1	4.0	0.71	ng/L	09/07/2023 2247
PFOSA	ND		1	4.0	0.61	ng/L	09/07/2023 2247
PFPeS	ND		1	4.0	0.59	ng/L	09/07/2023 2247
PFHxS	ND		1	4.0	0.55	ng/L	09/07/2023 2247
PFBA	ND		1	4.0	0.60	ng/L	09/07/2023 2247
PFDA	ND		1	4.0	0.52	ng/L	09/07/2023 2247
PFDoA	ND		1	4.0	0.47	ng/L	09/07/2023 2247
PFHpA	ND		1	4.0	0.45	ng/L	09/07/2023 2247
PFHxA	ND		1	4.0	0.69	ng/L	09/07/2023 2247
PFNA	ND		1	4.0	0.46	ng/L	09/07/2023 2247
PFOA	ND		1	4.0	0.83	ng/L	09/07/2023 2247
PFPeA	ND		1	4.0	0.54	ng/L	09/07/2023 2247
PFTeDA	ND		1	4.0	0.60	ng/L	09/07/2023 2247
PFTrDA	ND		1	4.0	0.53	ng/L	09/07/2023 2247
PFUdA	ND		1	4.0	0.63	ng/L	09/07/2023 2247
PFOS	ND		1	4.0	2.0	ng/L	09/07/2023 2247

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		102	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		91	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ84190-001
Batch: 84190
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/06/2023 2025

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		97	25-150
13C8_PFOS		86	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ84190-002
Batch: 84190
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/06/2023 2025

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	98	50-150	09/07/2023 2258
11Cl-PF3OUdS	15	14		1	94	50-150	09/07/2023 2258
8:2 FTS	15	15		1	99	50-150	09/07/2023 2258
6:2 FTS	15	15		1	100	50-150	09/07/2023 2258
4:2 FTS	15	15		1	99	50-150	09/07/2023 2258
GenX	32	34		1	107	50-150	09/07/2023 2258
ADONA	15	15		1	98	50-150	09/07/2023 2258
EtFOSAA	16	16		1	98	50-150	09/07/2023 2258
MeFOSAA	16	15		1	93	50-150	09/07/2023 2258
PFBS	14	14		1	97	50-150	09/07/2023 2258
PFDS	15	15		1	100	50-150	09/07/2023 2258
PFHpS	15	14		1	95	50-150	09/07/2023 2258
PFNS	15	17		1	108	50-150	09/07/2023 2258
PFOSA	16	17		1	107	50-150	09/07/2023 2258
PFPeS	15	15		1	103	50-150	09/07/2023 2258
PFHxS	15	12		1	85	50-150	09/07/2023 2258
PFBA	16	15		1	94	50-150	09/07/2023 2258
PFDA	16	17		1	105	50-150	09/07/2023 2258
PFDoA	16	16		1	103	50-150	09/07/2023 2258
PFHpA	16	15		1	95	50-150	09/07/2023 2258
PFHxA	16	17		1	109	50-150	09/07/2023 2258
PFNA	16	16		1	97	50-150	09/07/2023 2258
PFOA	16	16		1	100	50-150	09/07/2023 2258
PFPeA	16	15		1	95	50-150	09/07/2023 2258
PFTeDA	16	16		1	97	50-150	09/07/2023 2258
PFTrDA	16	15		1	94	50-150	09/07/2023 2258
PFUdA	16	15		1	97	50-150	09/07/2023 2258
PFOS	15	14		1	92	50-150	09/07/2023 2258

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	25-150
13C2_6:2FTS		118	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		101	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ84190-002
Batch: 84190
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/06/2023 2025

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		103	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		112	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

PLANT - 6

Pace Analytical® Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

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West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number YH29013

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: BRS2 / 08/29/23 Lot #: YH29013

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:			
☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.6 / 2.6 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Marina Samp

Project Name: RACER Lansing PFAS

Project Number: 30171056.0370B

Lot Number:**YG26012**

Date Completed:08/07/2023

08/08/2023 9:41 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Case Narrative
Arcadis U.S., Inc.
Lot Number: YG26012

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 180.1, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform. Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM2520 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011, Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B. Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,4-Dioxane, 1,3,5-Trinitrobenzene, 1,4- Naphthoquinone, 1,4-Phenylenediamine, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4-Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12-Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5- Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18, PFAS by Isotope Dilution SOP.

Pace is a DoD/DoE and TNI accredited laboratory; however, Pace is not accredited for PFAS Direct Aqueous Injection or Method D8421.

PFAS
Samples YG26012-008, YG26012-009 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following sample was outside control limits: YG26012-001. MS/MSD was performed with concurring results. The data has been reported.

Surrogate recovery for the following samples was outside the upper control limit: YG26012-002, YG26012-003, YG26012-004, YG26012-006, YG26012-007, YG26012-010, YG26012-011. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: YG26012-008. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside control limits: YG26012-005, YG26012-009. Re-extraction and/or re-analysis was performed with concurring results. The original analysis has been reported.

The MS/MSD associated with sample YG26012-001 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YG26012

Project Name: RACER Lansing PFAS

Project Number: 30171056.0370B

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YG26012-001	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-001	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-001	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-001	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YG26012-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-003	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-003	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-003	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-003	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YG26012-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-004	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-004	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-004	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-004	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-005	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YG26012-005	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-005	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-005	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-005	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YG26012-005	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-006	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-006	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-006	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YG26012-006	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-006	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-007	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-007	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-007	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-007	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-008	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-008	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-008	1	Perfluorooctanesulfonic acid (PFOS)	M-03

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YG26012

Project Name: RACER Lansing PFAS

Project Number: 30171056.0370B

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YG26012-009	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluoro-n-heptanoic acid (PFHpA)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YG26012-009	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-010	1	1H,1H,2H,2H-perfluorohexane sulfonic	M-03
PFAS by ID SOP	YG26012-010	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-010	2	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-010	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YG26012-001MS	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YG26012-001MS	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YQ81261-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YG26012-001MS	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YG26012-001MD	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YG26012-001MS	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-001MD	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	YG26012-001MS	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-001MD	1	Perfluoro-n-butanoic acid (PFBA)	M-03
PFAS by ID SOP	YG26012-001MD	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	YG26012-001MD	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YG26012-001MS	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	YQ81261-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-001MS	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YG26012-001MD	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YQ81579-001	1	13C2_6:2FTS	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YG26012

Project Name: RACER Lansing PFAS

Project Number: 30171056.0370B

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MichAve-MH-3_072523	Aqueous	07/25/2023 0845	07/26/2023
002	Verlinden-MH-5_072523	Aqueous	07/25/2023 0905	07/26/2023
003	Osborn-MH-1_072523	Aqueous	07/25/2023 0925	07/26/2023
004	Dup-01_072523	Aqueous	07/25/2023	07/26/2023
005	Osborn-MH-1-SW_072523	Aqueous	07/25/2023 0935	07/26/2023
006	Osborn-MH-3_072523	Aqueous	07/25/2023 0955	07/26/2023
007	Osborn-CB-2_072523	Aqueous	07/25/2023 1005	07/26/2023
008	P3-MH-284_072523	Aqueous	07/25/2023 1055	07/26/2023
009	P2-MH-2_072523	Aqueous	07/25/2023 1120	07/26/2023
010	P2-MH-W_072523	Aqueous	07/25/2023 1155	07/26/2023
011	FB-01_072523	Aqueous	07/25/2023 1208	07/26/2023
012	EB-01_072523	Aqueous	07/25/2023 1210	07/26/2023

(12 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YG26012

Project Name: RACER Lansing PFAS

Project Number: 30171056.0370B

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MichAve-MH-3_072523	Aqueous	PFHxS	PFAS by ID	5.1	M-03	ng/L	11
001	MichAve-MH-3_072523	Aqueous	PFBA	PFAS by ID	8.2	QM-03	ng/L	11
001	MichAve-MH-3_072523	Aqueous	PFHpA	PFAS by ID	3.7	JM-03	ng/L	11
001	MichAve-MH-3_072523	Aqueous	PFOA	PFAS by ID	5.9		ng/L	11
001	MichAve-MH-3_072523	Aqueous	PFPeA	PFAS by ID	5.5		ng/L	11
001	MichAve-MH-3_072523	Aqueous	PFOS	PFAS by ID	4.9	M-03	ng/L	11
002	Verlinden-MH-5_072523	Aqueous	PFBS	PFAS by ID	4.1	M-03	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFHxS	PFAS by ID	2.1	JM-03	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFBA	PFAS by ID	13	M-03	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFDA	PFAS by ID	1.1	JM-03	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFHpA	PFAS by ID	17		ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFHxA	PFAS by ID	23		ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFNA	PFAS by ID	3.0	J	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFOA	PFAS by ID	26	M-03	ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFPeA	PFAS by ID	26		ng/L	13
002	Verlinden-MH-5_072523	Aqueous	PFOS	PFAS by ID	11	M-03	ng/L	13
003	Osborn-MH-1_072523	Aqueous	PFBS	PFAS by ID	1.7	JM-03	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFHxS	PFAS by ID	2.1	JM-03	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFBA	PFAS by ID	14		ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFDA	PFAS by ID	1.9	J	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFHpA	PFAS by ID	10	M-03	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFHxA	PFAS by ID	12		ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFNA	PFAS by ID	3.1	J	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFOA	PFAS by ID	27	M-03	ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFPeA	PFAS by ID	12		ng/L	15
003	Osborn-MH-1_072523	Aqueous	PFOS	PFAS by ID	14	M-03	ng/L	15
004	Dup-01_072523	Aqueous	PFBS	PFAS by ID	1.8	JM-03	ng/L	17
004	Dup-01_072523	Aqueous	PFHxS	PFAS by ID	2.3	JM-03	ng/L	17
004	Dup-01_072523	Aqueous	PFBA	PFAS by ID	13		ng/L	17
004	Dup-01_072523	Aqueous	PFDA	PFAS by ID	1.7	J	ng/L	17
004	Dup-01_072523	Aqueous	PFHpA	PFAS by ID	9.9	M-03	ng/L	17
004	Dup-01_072523	Aqueous	PFHxA	PFAS by ID	13		ng/L	17
004	Dup-01_072523	Aqueous	PFNA	PFAS by ID	3.0	J	ng/L	17
004	Dup-01_072523	Aqueous	PFOA	PFAS by ID	23		ng/L	17
004	Dup-01_072523	Aqueous	PFPeA	PFAS by ID	11		ng/L	17
004	Dup-01_072523	Aqueous	PFOS	PFAS by ID	14	M-03	ng/L	17
005	Osborn-MH-1-SW_072523	Aqueous	PFBS	PFAS by ID	2.2	JM-03	ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFHxS	PFAS by ID	2.9	JM-03	ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFBA	PFAS by ID	29	QM-03	ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFDA	PFAS by ID	16		ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFHpA	PFAS by ID	34		ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFHxA	PFAS by ID	37		ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFNA	PFAS by ID	14		ng/L	19

Detection Summary (Continued)

Lot Number: YG26012

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	Osborn-MH-1-SW_072523	Aqueous	PFOA	PFAS by ID	49		ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFPeA	PFAS by ID	50	M-03	ng/L	19
005	Osborn-MH-1-SW_072523	Aqueous	PFOS	PFAS by ID	47	M-03	ng/L	19
006	Osborn-MH-3_072523	Aqueous	PFBS	PFAS by ID	1.6	JM-03	ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFHxS	PFAS by ID	2.1	JM-03	ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFBA	PFAS by ID	16		ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFDA	PFAS by ID	2.5	JM-03	ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFHpA	PFAS by ID	11	M-03	ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFHxA	PFAS by ID	16		ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFNA	PFAS by ID	8.4		ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFOA	PFAS by ID	40		ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFPeA	PFAS by ID	13		ng/L	21
006	Osborn-MH-3_072523	Aqueous	PFOS	PFAS by ID	52	M-03	ng/L	21
007	Osborn-CB-2_072523	Aqueous	PFBS	PFAS by ID	1.4	JM-03	ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFHxS	PFAS by ID	1.8	JM-03	ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFBA	PFAS by ID	14		ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFDA	PFAS by ID	2.1	J	ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFHpA	PFAS by ID	11	M-03	ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFHxA	PFAS by ID	17		ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFNA	PFAS by ID	4.2		ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFOA	PFAS by ID	26		ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFPeA	PFAS by ID	17		ng/L	23
007	Osborn-CB-2_072523	Aqueous	PFOS	PFAS by ID	23	M-03	ng/L	23
008	P3-MH-284_072523	Aqueous	PFBA	PFAS by ID	4.2	QM-03	ng/L	25
008	P3-MH-284_072523	Aqueous	PFOS	PFAS by ID	5.1	M-03	ng/L	25
009	P2-MH-2_072523	Aqueous	PFBS	PFAS by ID	2.9	JM-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFHxS	PFAS by ID	3.4	JM-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFBA	PFAS by ID	9.5	QM-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFDA	PFAS by ID	1.6	J	ng/L	27
009	P2-MH-2_072523	Aqueous	PFHpA	PFAS by ID	7.2	M-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFHxA	PFAS by ID	9.0	M-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFNA	PFAS by ID	1.9	JM-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFOA	PFAS by ID	14	M-03	ng/L	27
009	P2-MH-2_072523	Aqueous	PFPeA	PFAS by ID	7.0		ng/L	27
009	P2-MH-2_072523	Aqueous	PFOS	PFAS by ID	17	M-03	ng/L	27
010	P2-MH-W_072523	Aqueous	PFHxS	PFAS by ID	1.6	JM-03	ng/L	29
010	P2-MH-W_072523	Aqueous	PFBA	PFAS by ID	4.1	M-03	ng/L	29
010	P2-MH-W_072523	Aqueous	PFOA	PFAS by ID	2.1	JM-03	ng/L	29

(81 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-001**

Description: **MichAve-MH-3_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0845** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1752	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	S	4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.1**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.2**	**QM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.9**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.5**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.9**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	289	50-150
13C2_6:2FTS	N	236	50-150
13C2_8:2FTS		128	50-150
13C2_PFDoA		86	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		71	50-150
13C4_PFBA	N	43	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		69	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		95	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-001**

Description: **MichAve-MH-3_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0845** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-002**

Description: **Verlinden-MH-5_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0905** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1824	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.1**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.1**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.1**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**23**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.0**	**J**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**26**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**11**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	306	50-150
13C2_6:2FTS	N	229	50-150
13C2_8:2FTS		123	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		80	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		100	50-150
13C3-HFPO-DA		73	50-150
13C4_PFBA		51	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		78	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-002**

Description: **Verlinden-MH-5_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0905** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		101	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-003**

Description: **Osborn-MH-1_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0925** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1835	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.1**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.9**	**J**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**10**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**12**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.1**	**J**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**27**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**14**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	305	50-150
13C2_6:2FTS	N	213	50-150
13C2_8:2FTS		115	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		73	50-150
13C4_PFBA		58	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		87	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-003**

Description: **Osborn-MH-1_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0925** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		97	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		90	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-004**

Description: **Dup-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1845	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.2	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.2	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.2	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.3**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.7**	**J**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.9**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**13**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.0**	**J**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**11**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**14**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	254	50-150
13C2_6:2FTS	N	210	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		77	50-150
13C4_PFBA		58	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-004**

Description: **Dup-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		111	50-150
13C8_PFOS		89	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-005**

Description: **Osborn-MH-1-SW_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0935** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1917	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	QM-03	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.2**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.9**	**JM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**29**	**QM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**16**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**34**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**37**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**14**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**49**		**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**50**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**47**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	303	50-150
13C2_6:2FTS	N	317	50-150
13C2_8:2FTS	N	209	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		66	50-150
13C3_PFBS		80	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		62	50-150
13C4_PFBA	N	41	50-150
13C4_PFHpA		80	50-150
13C5_PFHxA		79	50-150
13C5_PFPeA		65	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		103	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-005**

Description: **Osborn-MH-1-SW_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0935** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	50-150
13C8_PFOS		96	50-150
13C8_PFOSA		99	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		110	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-006**

Description: **Osborn-MH-3_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0955** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1928	ARC2	07/31/2023 1049	81261
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2023 1727	ARC2	08/03/2023 1131	81579

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.1**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**16**		**4.0**	**1.0**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.5**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**11**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**16**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**8.4**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**40**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**52**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	248	50-150	N	219	50-150
13C2_6:2FTS	N	184	50-150	N	165	50-150
13C2_8:2FTS		100	50-150		93	50-150
13C2_PFDoA		90	50-150		73	50-150
13C2_PFTeDA		83	50-150		71	50-150
13C3_PFBS		87	50-150		77	50-150
13C3_PFHxS		97	50-150		85	50-150
13C3-HFPO-DA		77	50-150		72	50-150
13C4_PFBA	N	47	50-150		57	50-150
13C4_PFHpA		91	50-150		80	50-150
13C5_PFHxA		94	50-150		87	50-150
13C5_PFPeA		86	50-150		81	50-150
13C6_PFDA		98	50-150		90	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-006**

Description: **Osborn-MH-3_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 0955** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	50-150		79	50-150
13C8_PFOA		108	50-150		96	50-150
13C8_PFOS		95	50-150		79	50-150
13C8_PFOSA		95	50-150		83	50-150
13C9_PFNA		101	50-150		90	50-150
d5-EtFOSAA		88	50-150		93	50-150
d3-MeFOSAA		95	50-150		95	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-007**

Description: **Osborn-CB-2_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1005** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1939	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**JM-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.1**	**J**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**11**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**17**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.2**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**17**		**4.1**	**1.0**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**23**	**M-03**	**4.1**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	279	50-150
13C2_6:2FTS	N	227	50-150
13C2_8:2FTS		122	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		95	50-150
13C3-HFPO-DA		79	50-150
13C4_PFBA		56	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		82	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		92	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-007**

Description: **Osborn-CB-2_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1005** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	50-150
13C8_PFOS		94	50-150
13C8_PFOSA		92	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-008**

Description: **P3-MH-284_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1055** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 1949	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.2**	**QM-03**	**4.0**	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	M-03	4.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.1**	**M-03**	**4.0**	**1.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	323	50-150
13C2_6:2FTS	N	260	50-150
13C2_8:2FTS		119	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		69	50-150
13C3_PFBS		71	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		60	50-150
13C4_PFBA	N	34	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		63	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		91	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-008**

Description: **P3-MH-284_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1055** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		98	50-150
13C8_PFOSA		95	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-009**

Description: **P2-MH-2_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1120** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 2000	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.6	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.6	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.6	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**JM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.4**	**JM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.5**	**QM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.6**	**J**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.2**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.0**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.9**	**JM-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.0**		**3.8**	**0.96**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**17**	**M-03**	**3.8**	**0.96**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	285	50-150
13C2_6:2FTS	N	245	50-150
13C2_8:2FTS		140	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		74	50-150
13C3_PFBS		76	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		60	50-150
13C4_PFBA	N	40	50-150
13C4_PFHpA		75	50-150
13C5_PFHxA		72	50-150
13C5_PFPeA		62	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		90	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-009**

Description: **P2-MH-2_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1120** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	50-150
13C8_PFOS		82	50-150
13C8_PFOSA		87	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-010**

Description: **P2-MH-W_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1155** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 2010	ARC2	07/31/2023 1049	81261
2	SOP SPE	PFAS by ID SOP QSM B-15	1	08/04/2023 1810	ARC2	08/03/2023 1131	81579

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	QM-03	7.8	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.6**	**JM-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.1**	**M-03**	**3.8**	**0.94**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.1**	**JM-03**	**3.9**	**0.97**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.9	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	217	50-150	N	203	50-150
13C2_6:2FTS	N	153	50-150		141	50-150
13C2_8:2FTS		88	50-150		93	50-150
13C2_PFDoA		87	50-150		77	50-150
13C2_PFTeDA		77	50-150		75	50-150
13C3_PFBS		81	50-150		81	50-150
13C3_PFHxS		92	50-150		86	50-150
13C3-HFPO-DA		77	50-150		76	50-150
13C4_PFBA	N	34	50-150		52	50-150
13C4_PFHpA		93	50-150		80	50-150
13C5_PFHxA		90	50-150		87	50-150
13C5_PFPeA		77	50-150		80	50-150
13C6_PFDA		94	50-150		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-010**

Description: **P2-MH-W_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1155** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		87	50-150		85	50-150
13C8_PFOA		98	50-150		93	50-150
13C8_PFOS		84	50-150		78	50-150
13C8_PFOSA		89	50-150		83	50-150
13C9_PFNA		91	50-150		83	50-150
d5-EtFOSAA		85	50-150		92	50-150
d3-MeFOSAA		83	50-150		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-011**

Description: **FB-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1208** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 2021	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		92	50-150
13C2_6:2FTS	N	151	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		83	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		87	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		83	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		79	50-150
13C7_PFUdA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-011**

Description: **FB-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1208** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		85	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-012**

Description: **EB-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/01/2023 2032	ARC2	07/31/2023 1049	81261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.9	0.98	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		102	50-150
13C2_6:2FTS		150	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		75	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		88	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YG26012-012**

Description: **EB-01_072523** Matrix: **Aqueous**

Date Sampled: **07/25/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **07/26/2023** Project Number: **30171056.0370B**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	50-150
13C8_PFOS		88	50-150
13C8_PFOSA		88	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ81261-001
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	2.0	ng/L	08/01/2023 1710
11Cl-PF3OUdS	ND		1	8.0	2.0	ng/L	08/01/2023 1710
8:2 FTS	ND		1	8.0	2.0	ng/L	08/01/2023 1710
6:2 FTS	ND		1	8.0	2.0	ng/L	08/01/2023 1710
4:2 FTS	ND		1	8.0	2.0	ng/L	08/01/2023 1710
GenX	ND		1	8.0	2.0	ng/L	08/01/2023 1710
ADONA	ND		1	8.0	2.0	ng/L	08/01/2023 1710
EtFOSAA	ND		1	8.0	2.0	ng/L	08/01/2023 1710
MeFOSAA	ND		1	8.0	2.0	ng/L	08/01/2023 1710
PFBS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFDS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFHpS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFNS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFOSA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFPeS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFHxS	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFBA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFDA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFDoA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFHpA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFHxA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFNA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFOA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFPeA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFTeDA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFTrDA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFUdA	ND		1	4.0	1.0	ng/L	08/01/2023 1710
PFOS	ND		1	4.0	1.0	ng/L	08/01/2023 1710

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		108	50-150
13C2_6:2FTS	N	220	50-150
13C2_8:2FTS		86	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ81261-001
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		112	50-150
13C8_PFOS		97	50-150
13C8_PFOSA		96	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ81261-002
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	17		1	113	50-150	08/01/2023 1721
11Cl-PF3OUdS	15	15		1	98	50-150	08/01/2023 1721
8:2 FTS	15	14		1	94	67-138	08/01/2023 1721
6:2 FTS	15	17		1	114	64-140	08/01/2023 1721
4:2 FTS	15	16		1	105	63-143	08/01/2023 1721
GenX	32	33		1	102	50-150	08/01/2023 1721
ADONA	15	17		1	112	50-150	08/01/2023 1721
EtFOSAA	16	18		1	112	61-135	08/01/2023 1721
MeFOSAA	16	16	M-03	1	99	65-136	08/01/2023 1721
PFBS	14	16		1	111	72-130	08/01/2023 1721
PFDS	15	16		1	102	53-142	08/01/2023 1721
PFHpS	15	15		1	100	69-134	08/01/2023 1721
PFNS	15	16		1	105	69-127	08/01/2023 1721
PFOSA	16	17		1	108	67-137	08/01/2023 1721
PFPeS	15	18		1	117	71-127	08/01/2023 1721
PFHxS	15	14		1	98	68-131	08/01/2023 1721
PFBA	16	17		1	109	73-129	08/01/2023 1721
PFDA	16	16		1	103	71-129	08/01/2023 1721
PFDoA	16	19		1	116	72-134	08/01/2023 1721
PFHpA	16	16		1	99	72-130	08/01/2023 1721
PFHxA	16	16		1	100	72-129	08/01/2023 1721
PFNA	16	20		1	126	69-130	08/01/2023 1721
PFOA	16	17		1	107	71-133	08/01/2023 1721
PFPeA	16	16		1	102	72-129	08/01/2023 1721
PFTeDA	16	16		1	98	71-132	08/01/2023 1721
PFTrDA	16	13		1	84	65-144	08/01/2023 1721
PFUdA	16	15		1	96	69-133	08/01/2023 1721
PFOS	15	16	M-03	1	110	65-140	08/01/2023 1721

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		98	50-150
13C2_6:2FTS	N	180	50-150
13C2_8:2FTS		84	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		60	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		85	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		92	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ81261-002
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		105	50-150
13C8_PFOS		86	50-150
13C8_PFOSA		93	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YG26012-001MS
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	15		1	96	50-150	08/01/2023 1803
11Cl-PF3OUdS	ND	15	14		1	90	50-150	08/01/2023 1803
8:2 FTS	ND	16	16		1	102	67-138	08/01/2023 1803
6:2 FTS	ND	16	17	M-03	1	110	64-140	08/01/2023 1803
4:2 FTS	ND	15	15		1	100	63-143	08/01/2023 1803
GenX	ND	33	36		1	111	50-150	08/01/2023 1803
ADONA	ND	15	15		1	96	50-150	08/01/2023 1803
EtFOSAA	ND	16	17	M-03	1	106	61-135	08/01/2023 1803
MeFOSAA	ND	16	16	M-03	1	98	65-136	08/01/2023 1803
PFBS	ND	14	17		1	121	72-130	08/01/2023 1803
PFDS	ND	16	15		1	96	53-142	08/01/2023 1803
PFHpS	ND	16	17		1	107	69-134	08/01/2023 1803
PFNS	ND	16	15		1	98	69-127	08/01/2023 1803
PFOSA	ND	16	17		1	105	67-137	08/01/2023 1803
PFPeS	ND	15	18		1	119	71-127	08/01/2023 1803
PFHxS	5.1	15	16	M-03	1	75	68-131	08/01/2023 1803
PFBA	8.2	16	26	M-03	1	106	73-129	08/01/2023 1803
PFDA	ND	16	17		1	103	71-129	08/01/2023 1803
PFDoA	ND	16	17		1	107	72-134	08/01/2023 1803
PFHpA	3.7	16	19		1	96	72-130	08/01/2023 1803
PFHxA	ND	16	21		1	125	72-129	08/01/2023 1803
PFNA	ND	16	17		1	104	69-130	08/01/2023 1803
PFOA	5.9	16	21		1	92	71-133	08/01/2023 1803
PFPeA	5.5	16	24	M-03	1	112	72-129	08/01/2023 1803
PFTeDA	ND	16	16		1	98	71-132	08/01/2023 1803
PFTrDA	ND	16	15		1	94	65-144	08/01/2023 1803
PFUdA	ND	16	18		1	108	69-133	08/01/2023 1803
PFOS	4.9	15	21	M-03	1	108	65-140	08/01/2023 1803

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	302	50-150
13C2_6:2FTS	N	249	50-150
13C2_8:2FTS		132	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		84	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		65	50-150
13C4_PFBA	N	44	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		69	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YG26012-001MS
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		104	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		111	50-150
13C8_PFOS		95	50-150
13C8_PFOSA		98	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YG26012-001MD
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	15	14		1	94	1.8	50-150	30	08/01/2023 1814
11Cl-PF3OUdS	ND	16	14		1	91	0.97	50-150	30	08/01/2023 1814
8:2 FTS	ND	16	15		1	96	5.3	67-138	30	08/01/2023 1814
6:2 FTS	ND	16	16		1	105	4.1	64-140	30	08/01/2023 1814
4:2 FTS	ND	15	16		1	102	2.5	63-143	30	08/01/2023 1814
GenX	ND	33	37		1	112	1.8	50-150	30	08/01/2023 1814
ADONA	ND	16	14		1	94	1.5	50-150	30	08/01/2023 1814
EtFOSAA	ND	16	17		1	102	3.0	61-135	30	08/01/2023 1814
MeFOSAA	ND	16	18	M-03	1	107	9.3	65-136	30	08/01/2023 1814
PFBS	ND	15	17		1	118	1.3	72-130	30	08/01/2023 1814
PFDS	ND	16	15		1	94	1.0	53-142	30	08/01/2023 1814
PFHpS	ND	16	16		1	104	2.1	69-134	30	08/01/2023 1814
PFNS	ND	16	16		1	98	1.1	69-127	30	08/01/2023 1814
PFOSA	ND	16	17		1	103	0.95	67-137	30	08/01/2023 1814
PFPeS	ND	15	20	N	1	129	8.8	71-127	30	08/01/2023 1814
PFHxS	5.1	15	19	M-03	1	92	15	68-131	30	08/01/2023 1814
PFBA	8.2	16	26	M-03	1	109	2.6	73-129	30	08/01/2023 1814
PFDA	ND	16	15		1	93	9.9	71-129	30	08/01/2023 1814
PFDoA	ND	16	16		1	98	8.2	72-134	30	08/01/2023 1814
PFHpA	3.7	16	20		1	98	1.9	72-130	30	08/01/2023 1814
PFHxA	ND	16	18	M-03	1	111	12	72-129	30	08/01/2023 1814
PFNA	ND	16	18		1	107	3.5	69-130	30	08/01/2023 1814
PFOA	5.9	16	22	M-03	1	101	7.1	71-133	30	08/01/2023 1814
PFPeA	5.5	16	22		1	99	8.6	72-129	30	08/01/2023 1814
PFTeDA	ND	16	17		1	105	7.0	71-132	30	08/01/2023 1814
PFTrDA	ND	16	15		1	93	0.29	65-144	30	08/01/2023 1814
PFUdA	ND	16	17		1	105	2.4	69-133	30	08/01/2023 1814
PFOS	4.9	15	19	M-03	1	94	10	65-140	30	08/01/2023 1814

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	306	50-150
13C2_6:2FTS	N	235	50-150
13C2_8:2FTS		133	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		81	50-150
13C3_PFHxS		94	50-150
13C3-HFPO-DA		66	50-150
13C4_PFBA	N	43	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		74	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YG26012-001MD
Batch: 81261
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/31/2023 1049

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		117	50-150
13C7_PFUdA		93	50-150
13C8_PFOA		102	50-150
13C8_PFOS		100	50-150
13C8_PFOSA		94	50-150
13C9_PFNA		110	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ81579-001
Batch: 81579
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/03/2023 1131

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
PFBA	ND		1	4.0	1.0	ng/L	08/04/2023 1655

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		86	50-150
13C2_6:2FTS	M-03N	166	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		77	50-150
13C2_PFTeDA		75	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		87	50-150
13C3-HFPO-DA		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		104	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		85	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
DL = Detection Limit

ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ81579-002
Batch: 81579
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/03/2023 1131

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
PFBA	16	17		1	108	73-129	08/04/2023 1706

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		85	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		91	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		81	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		82	50-150
13C8_PFOA		91	50-150
13C8_PFOS		81	50-150
13C8_PFOSA		84	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		109	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 148805

Client: Arcadis	Report to Contact: Marina Sump	Telephone No. / E-mail: 248-994-2318 / marina.sump@arcadis.com
Address: 28550 Cabot Dr., Ste 500	Sampler's Signature: x Anyssa Mandich	Quote No.
City: Novi	State: MI	Zip Code: 48377
Project Name: RACER Lansing PFAS Delineation	Printed Name: Anyssa Mandich	Analysis (Attach list if more space is needed)
Project No.: 30171056.0370B	P.O. No.	Page 1 of 2

YG26012

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Other	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Other	EPA 537 M (6 PFAS) MDL LOQ of 2ng	Remarks / Cooler I.D.
MichAve-MH-3_072523	7/25/23	0845	G	X			6							6	MS/MSD
Berlinden-MH-5_072523	7/25/23	0905	G	X			2							2	
Osborn-MH-1_072523	7/25/23	0925	G	X			2							2	Please provide QC results + EDD for all samples
DUP-01_072523	7/25/23	—	G	X			2							2	
Osborn-MH-1SN_072523	7/25/23	0935	G	X			2							2	
Osborn-MH-3_072523	7/25/23	0955	G	X			2							2	
Osborn-CB-2_072523	7/25/23	1005	G	X			2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT.): X Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client X Disposal by Lab

Possible Hazard Identification: X Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Relinquished by	Date	Time	Received by	Date	Time
1.	Anyssa Mandich/Arcadis	7/25/23	1400	FedEx	7/25/23	1400
2.		Date	Time		Date	Time
3.		Date	Time		Date	Time
4.	FedEx	07/26/23	1010	[illegible]	07/26/23	1010

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No Ice Pack — Receipt Temp: 1.8 °C — Temp Blank: Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 148804

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 / Marina.Samp@arcadis.com	Quote No.
Address: 28550 Cabot Dr. Ste 500	Sampler's Signature: x Amyssa Mandich	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Novi	State: MI	Zip Code: 48377	Printed Name: Amyssa Mandich
Project Name: RACER Lansing PFAS Delineation			
Project No.	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	HNO3	H2SO4	NaOH	NaOH/ZnAc	Zn Acetate	Field Filtered	EPA 537 M (PFAS) MS-L-537 v2.0							Remarks / Cooler I.D.
PZ-MH-284_072523	7/25/23	1055	G	X			2							2							Please
PZ-MH-2_072523	7/25/23	1120	G	X			2							2							provide results
PZ-MH-W_072523	7/25/23	1155	G	X			2							2							QC + EDD
FB-01_072523	7/25/23	1208	G	X			2							2							for all samples
EB-01_072523	7/25/23	12-10	G	X			2							2							

YG26012
KES2

Turn Around Time Required (Prior lab approval required for expedited TAT.): X Standard ☐ Rush (Specify)	Sample Disposal: ☐ Return to Client X Disposal by Lab	Possible Hazard Identification: X Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown	QC Requirements (Specify)

1. Relinquished by: Amyssa Mandich/Arcadis	Date: 7/25/23	Time: 1400	1. Received by: FedEX	Date: 7/25/23	Time: 1400
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEX	Date: 07/26/23	Time: 1010	4. Laboratory Received by: [illegible]	Date: 07/26/23	Time: 1010

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): Yes / No Ice Pack
Receipt Temp: 2.3 °C
Temp Blank: Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MEI0SNS-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: BRS2 / 07/26/23 Lot #: YG26012

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.8 / 1.8 °C 2.3 / 2.3 °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? ____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25015

BRS2 07/26/23

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Racer – Lansing Plant 2,3&6

Data Review

Lansing, Michigan

VOC Analyses

SDG # S52827, S52828 and S52830

VOCs Analyses Performed By:
Merit Laboratories Inc.
East Lansing, Michigan

Report #52348R
Review Level: Tier II
Project: 30171056.00603

Summary

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # S52827, S52828 and S52830 for samples collected in association with Plants 2, 3 & 6 in Lansing Michigan. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	1,4-D	PFAS	MET	MISC
S52827	MW-13-34	552827-1	GW	08/30/23			X			
	PW-14-03R	552827-2	GW	08/30/23			X			
	MW-12-21	552827-3	GW	08/30/23			X			
	MW-13-22	552827-4	GW	08/30/23			X			
	AS-19-A07	552827-7	GW	08/30/23			X			
	AS-19-A06	552827-8	GW	08/30/23			X			
	TW-15-11	552827-9	GW	08/30/23			X			
	TW-14-06	552827-10	GW	08/30/23			X			
	DUP-04	552827-11	GW	08/30/23	TW-14-06		X			
	Trip Blank	552827-12	Water	08/30/23			X			
S52828	MW-22-154	S52828-1	GW	08/29/23		X				
	MW-20-131	S52828-2	GW	08/29/23		X				
	MW-20-132	S52828-3	GW	08/29/23		X				
	DUP-03	S52828-6	GW	08/29/23	MW-22-154	X				
	Trip Blank	S52828-7	Water	08/29/23		X				
S52830	MW-22-157	S52830-1	GW	08/29/23		X	X			
	MW-22-155	S52830-2	GW	08/29/23			X			
	MW-22-153	S52830-3	GW	08/29/23		X	X			
	MW-22-156	S52830-4	GW	08/29/23		X	X			
	MW-14-58R	S52830-5	GW	08/29/23		X	X			
	Trip Blank	S52830-6	Water	08/29/23		X				

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	1,4-D	PFAS	MET	MISC
S52830	DUP-06	S52830-7	GW	08/29/23	MW-22-157	X	X			

Note:

1. SDG (S52827) Sample MW-13-22 was used as the MS/MSD.
2. SDG (S52828) Sample MW-20-130 was used as the MS/MSD.
3. SDG (S52827) A trip blank was submitted to the lab, logged in and placed on hold. The sample was not analyzed.

Analytical Data Package Documentation

The table below evaluates the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed chain-of-custody form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data package completeness and compliance		X		X	

Note:
QA = quality assurance

Organic Analysis Introduction

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260C and 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines NFG for Organic Superfund Methods Data Review, EPA-540-R-20-005 (November 2020), with reference to the historical (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate) and the Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound is considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

The "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R"

values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Volatile Organic Compounds Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260C and 8260B by SIM	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2 with hydrochloric acid

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the reporting limit (RL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. No other qualification of the sample results was required.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

For the SIM analysis, the samples were spiked with internal standards instead of surrogates. All internal standard recoveries were within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations

where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSDs exhibited recoveries and RPDs within the control limits.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
MW-22-154 MW-20-131	Tetrahydrofuran	<LL but >10%	AC
DUP-03 Trip Blank	Methyl Iodide	>UL	AC
MW-22-157 MW-22-153 MW-22-156 MW-14-58R DUP-06	Diethyl Ether	>UL	>UL
	Methyl Iodide	>UL	AC
	Bromochloromethane	>UL	AC
	Dibromomethane	>UL	AC

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Field Duplicate Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% is applied to the RPD between the parent sample and the field duplicate sample results for water matrices. For the case where the parent and/or duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL is applied to the difference between the results for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/ Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
TW-14-06 / DUP-04	1,4-Dioxane	5	4	AC
MW-22-154 / DUP-03	Vinyl Chloride	1	1	AC
	cis-1,2-Dichloroethene	3	3	AC
MW-22-157 / DUP-06	1,4-Dioxane	123	117	5.0%

Notes:
AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for VOCs

1,4-DIOXANE: SW-846 8260C and 8260B by SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks	X				X
C. Trip blanks		X		X	
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Internal Standard/Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content	X				X

Notes:

%R Percent recovery

RPD Relative percent difference

VALIDATION PERFORMED BY: Rachelle Borne

SIGNATURE: 

DATE: December 20, 2023

PEER REVIEW: Joseph C. Houser

DATE: December 27, 2023

Chain of Custody Corrected Sample Analysis Data Sheets

Plant _____

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C.O.C. PAGE # 1 OF _____

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO. | P.O. NO.
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.0470B | SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☒ Other MI

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Special Instructions
52827.01	8/30/23	1040	MW-13-34_083023	GW	3		3						3		
.02	8/30/23	1155	PW-14-03R_083023	GW	3		3						3		
.03	8/30/23	1250	MW-12-21_083023	GW	3		3						3		
.04/.05/.06	8/30/23	1355	MW-13-22_083023	GW	9		9						9		MS/MSD
.07	8/30/23	1035	AS-19-07_083023	GW	3		3						3		
.08	8/30/23	1140	AS-19-06_083023	GW	3		3						3		
.09	8/30/23	1330	TW-15-11_083023	GW	3		3						3		
.10	8/30/23	14:25	TW-14-06_083023	GW	3		3						3		
.11	8/30/23	—	DUP-04_083023	GW	3		3						3		
.12															

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Austin Westhuis (Sampler)	DATE 8/30/23	TIME 1605
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 8/30/23	TIME 1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S52827.01
Sample Tag: MW-13-34_083023
Collected Date/Time: 08/30/2023 10:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	106	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.02
Sample Tag: PW-14-03R_083023
Collected Date/Time: 08/30/2023 11:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.03
Sample Tag: MW-12-21_083023
Collected Date/Time: 08/30/2023 12:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 16:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	199	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.04
Sample Tag: MW-13-22_083023
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 17:07, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	138	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.05
Sample Tag: MW-13-22_083023 MS
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 20:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	185	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S52827.06
Sample Tag: MW-13-22_083023 MSD
Collected Date/Time: 08/30/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 21:17, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	194	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S52827.07
Sample Tag: AS-19-A07_083023
Collected Date/Time: 08/30/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 17:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.08
Sample Tag: AS-19-A06_083023
Collected Date/Time: 08/30/2023 11:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 23:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.09
Sample Tag: TW-15-11_083023
Collected Date/Time: 08/30/2023 13:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	120	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.10
Sample Tag: TW-14-06_083023
Collected Date/Time: 08/30/2023 14:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.11
Sample Tag: DUP-04_083023
Collected Date/Time: 08/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 18:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Lab Sample ID: S52827.12
Sample Tag: Trip Blank
Collected Date/Time: 08/30/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Other / Misc.

Method: , Run Date: 09/07/23 11:45, Analyst: MMC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Plant 6

Merit Laboratories, Inc.
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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.:
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.00102 | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Special Instructions
52828.01	8/29/23	1100	mw-22-154_082923	GW	3		3							3	
.02	8/29/23	1225	mw-20-131_082923	GW	3		3							3	
.03/.04/.05	8/29/23	1320	mw-20-132_082923	GW	9		9							9	MS/MSD
.06	8/29/23	—	DUP-03_082923	GW	3		3							3	
.07															

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Austin Westhuis (Sampler)	8/30/23	1605
RECEIVED BY: SIGNATURE/ORGANIZATION	8/30/23	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S52828.01
Sample Tag: MW-22-154_082923
Collected Date/Time: 08/29/2023 11:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/11/23 11:45	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:19, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	UJ
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.01 (continued)
Sample Tag: MW-22-154_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:19, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S52828.02
Sample Tag: MW-20-131_082923
Collected Date/Time: 08/29/2023 12:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/11/23 11:45	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:43, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	2	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	UJ 90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.02 (continued)
Sample Tag: MW-20-131_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/09/23 05:43, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.03
Sample Tag: MW-20-132_082923
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 21:09, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	7	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.03 (continued)
Sample Tag: MW-20-132_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 21:09, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.04
Sample Tag: MW-20-132_082923 MS
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	59	10		ug/L	1	60-29-7	1
Acetone	Not detected	50		ug/L	1	67-64-1	1
Methyl iodide	57	1		ug/L	1	74-88-4	1
Carbon disulfide	49	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	54	5		ug/L	1	1634-04-4	1
Acrylonitrile	50	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	45	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	40	5		ug/L	1	75-71-8	1
Chloromethane	46	5		ug/L	1	74-87-3	1
Vinyl chloride	47	1		ug/L	1	75-01-4	1
Bromomethane	49	5		ug/L	1	74-83-9	1
Chloroethane	46	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	43	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	46	1		ug/L	1	75-35-4	1
Methylene chloride	56	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	48	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	51	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	61	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	52	1		ug/L	1	67-66-3	1
Bromochloromethane	58	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	47	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Carbon tetrachloride	47	1		ug/L	1	56-23-5	1
Benzene	51	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	48	1		ug/L	1	107-06-2	1
Trichloroethene	50	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	53	1		ug/L	1	78-87-5	1
Bromodichloromethane	54	1		ug/L	1	75-27-4	1
Dibromomethane	60	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	57	1		ug/L	1	10061-01-5	1
Toluene	50	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	56	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	54	1		ug/L	1	79-00-5	1
Tetrachloroethene	50	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.04 (continued)
Sample Tag: MW-20-132_082923 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:04, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	45	1		ug/L	1	110-57-6	1
Dibromochloromethane	61	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	57	1		ug/L	1	106-93-4	1
Chlorobenzene	56	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	60	1		ug/L	1	630-20-6	1
Ethylbenzene	52	1		ug/L	1	100-41-4	1
p,m-Xylene*	105	2		ug/L	1		1
o-Xylene	53	1		ug/L	1	95-47-6	1
Styrene	56	1		ug/L	1	100-42-5	1
Isopropylbenzene	50	5		ug/L	1	98-82-8	1
Bromoform	59	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	53	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	53	1		ug/L	1	96-18-4	1
n-Propylbenzene	50	1		ug/L	1	103-65-1	1
Bromobenzene	60	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	53	1		ug/L	1	108-67-8	1
tert-Butylbenzene	48	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	53	1		ug/L	1	95-63-6	1
sec-Butylbenzene	46	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	47	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	52	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	53	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	53	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	49	1		ug/L	1	526-73-8	1
n-Butylbenzene	45	1		ug/L	1	104-51-8	1
Hexachloroethane	51	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	52	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	55	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	55	5		ug/L	1	87-61-6	1
Naphthalene	49	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	47	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.05
Sample Tag: MW-20-132_082923 MSD
Collected Date/Time: 08/29/2023 13:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/05/23 11:11	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:28, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	49	10		ug/L	1	60-29-7	1
Acetone	Not detected	50		ug/L	1	67-64-1	1
Methyl iodide	48	1		ug/L	1	74-88-4	1
Carbon disulfide	42	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	44	5		ug/L	1	1634-04-4	1
Acrylonitrile	42	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	39	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	36	5		ug/L	1	75-71-8	1
Chloromethane	40	5		ug/L	1	74-87-3	1
Vinyl chloride	41	1		ug/L	1	75-01-4	1
Bromomethane	41	5		ug/L	1	74-83-9	1
Chloroethane	39	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	36	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	40	1		ug/L	1	75-35-4	1
Methylene chloride	45	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	41	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	42	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	51	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	43	1		ug/L	1	67-66-3	1
Bromochloromethane	47	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	40	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Carbon tetrachloride	42	1		ug/L	1	56-23-5	1
Benzene	44	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	40	1		ug/L	1	107-06-2	1
Trichloroethene	44	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	44	1		ug/L	1	78-87-5	1
Bromodichloromethane	44	1		ug/L	1	75-27-4	1
Dibromomethane	51	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	46	1		ug/L	1	10061-01-5	1
Toluene	43	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	46	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	44	1		ug/L	1	79-00-5	1
Tetrachloroethene	44	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.05 (continued)
Sample Tag: MW-20-132_082923 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/01/23 14:28, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	41	1		ug/L	1	110-57-6	1
Dibromochloromethane	52	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	49	1		ug/L	1	106-93-4	1
Chlorobenzene	49	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	51	1		ug/L	1	630-20-6	1
Ethylbenzene	47	1		ug/L	1	100-41-4	1
p,m-Xylene*	93	2		ug/L	1		1
o-Xylene	47	1		ug/L	1	95-47-6	1
Styrene	49	1		ug/L	1	100-42-5	1
Isopropylbenzene	46	5		ug/L	1	98-82-8	1
Bromoform	51	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	47	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	46	1		ug/L	1	96-18-4	1
n-Propylbenzene	46	1		ug/L	1	103-65-1	1
Bromobenzene	52	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	48	1		ug/L	1	108-67-8	1
tert-Butylbenzene	44	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	48	1		ug/L	1	95-63-6	1
sec-Butylbenzene	43	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	44	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	47	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	48	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	48	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	45	1		ug/L	1	526-73-8	1
n-Butylbenzene	43	1		ug/L	1	104-51-8	1
Hexachloroethane	47	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	48	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	51	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	51	5		ug/L	1	87-61-6	1
Naphthalene	48	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	47	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S52828.06
Sample Tag: DUP-03_082923
Collected Date/Time: 08/29/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:26	ASW	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 19:57, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.06 (continued)

Sample Tag: DUP-03_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 19:57, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52828.07
Sample Tag: Trip Blank
Collected Date/Time: 08/29/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:26	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 16:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52828.07 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 16:01, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: RACER Lansing GWS - 30171056.0470A
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
52830.01	8/29/23	1110	MW-22-157_082923	GW	3		3						X	X
.02	8/29/23	1220	MW-22-155_082923	GW	3		3						X	
.03	8/29/23	1345	MW-22-153_082923	GW	3		3						X	X
.04	8/29/23	1430	MW-22-156_082923	GW	3		3						X	X
.05	8/29/23	1545	MW-14-58R_082923	GW	3		3						X	X
.06	—	—	Trip blank		1		1							X
.07	8/29/23	—	Dup-06_082923	GW	3		3						X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Sampler: Donald Richmond / Arcadis	8/30/23	1605
RECEIVED BY: SIGNATURE/ORGANIZATION: Johanna Young	8/30/23	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		
RECEIVED BY: SIGNATURE/ORGANIZATION		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS

NOTES: TEMP. ON ARRIVAL 11.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S52830.01
Sample Tag: MW-22-157_082923
Collected Date/Time: 08/29/2023 11:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	123	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 05:37, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.01 (continued)
Sample Tag: MW-22-157_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 05:37, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S52830.02
Sample Tag: MW-22-155_082923
Collected Date/Time: 08/29/2023 12:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/08/23 10:45	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 20:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	160	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.03
Sample Tag: MW-22-153_082923
Collected Date/Time: 08/29/2023 13:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	18	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:25, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.03 (continued)
Sample Tag: MW-22-153_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:25, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.04
Sample Tag: MW-22-156_082923
Collected Date/Time: 08/29/2023 14:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/07/23 19:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	144	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 08:22, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	20	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	300	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.04 (continued)
Sample Tag: MW-22-156_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 08:22, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S52830.05
Sample Tag: MW-14-58R_082923
Collected Date/Time: 08/29/2023 15:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 16:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	250	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:48, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S52830.05 (continued)
Sample Tag: MW-14-58R_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 06:48, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.06
Sample Tag: Trip Blank
Collected Date/Time: 08/29/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/06/23 20:59, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S52830.06 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/06/23 20:59, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S52830.07
Sample Tag: DUP-06_082923
Collected Date/Time: 08/29/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	11.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/07/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/08/23 05:39, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	117	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 07:12, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S52830.07 (continued)
Sample Tag: DUP-06_082923

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 09/07/23 07:12, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Tiffany Linder
ARCADIS US Inc
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Generated 11/18/2023 6:53:30 AM

JOB DESCRIPTION

Racer Lansing

JOB NUMBER

240-194288-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

my EOL

Job Notes

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Authorization



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Definitions/Glossary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-194288-1

Laboratory: Eurofins Cleveland

Narrative

Job Narrative
240-194288-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/26/2023 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.0°C

GC/MS Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Method Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Method	Method Description	Protocol	Laboratory
522	1,4 Dioxane (GC/MS SIM)	EPA	EET BUR
522	Solid-Phase Extraction (SPE)	EPA	EET BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-194288-1	MW-12-05R_102523	Water	10/25/23 09:50	10/26/23 09:50
240-194288-2	MW-12-06_102523	Water	10/25/23 11:00	10/26/23 09:50
240-194288-3	MW-17-87_102523	Water	10/25/23 12:35	10/26/23 09:50
240-194288-4	MW-19-118D_102523	Water	10/25/23 11:10	10/26/23 09:50
240-194288-5	MW-19-118S_102523	Water	10/25/23 12:35	10/26/23 09:50
240-194288-6	MW-13-44_102523	Water	10/25/23 14:25	10/26/23 09:50
240-194288-7	MW-19-125_102523	Water	10/25/23 13:50	10/26/23 09:50
240-194288-8	DUP-06_102523	Water	10/25/23 00:00	10/26/23 09:50

Detection Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-05R_102523 — Lab Sample ID: 240-194288-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.21		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-12-06_102523 — Lab Sample ID: 240-194288-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.12	J	0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-17-87_102523 — Lab Sample ID: 240-194288-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.2		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-19-118D_102523 — Lab Sample ID: 240-194288-4

No Detections.

Client Sample ID: MW-19-118S_102523 — Lab Sample ID: 240-194288-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.6		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-13-44_102523 — Lab Sample ID: 240-194288-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	5.7		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-19-125_102523 — Lab Sample ID: 240-194288-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.18	J	0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: DUP-06_102523 — Lab Sample ID: 240-194288-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	5.0		0.20	0.092	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-05R_102523
Date Collected: 10/25/23 09:50
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*83*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:21*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-06_102523
Date Collected: 10/25/23 11:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.12	J	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*72*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:35*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-17-87_102523
Date Collected: 10/25/23 12:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.2		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*84*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:48*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-118D_102523
Date Collected: 10/25/23 11:10
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-4
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*81*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:02*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-118S_102523
Date Collected: 10/25/23 12:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-5
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.6		0.20	0.092	ug/L		11/14/23 17:00	11/17/23 09:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*77*		*46 - 130*	*11/14/23 17:00*	*11/17/23 09:56*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-13-44_102523
Date Collected: 10/25/23 14:25
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-6
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.7		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:29*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-125_102523
Date Collected: 10/25/23 13:50
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-7
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.18	J	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*92*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:42*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: DUP-06_102523
Date Collected: 10/25/23 00:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-8
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.0		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*75*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:56*	*1*

Surrogate Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
		DXE							
Lab Sample ID	Client Sample ID	(46-130)							
240-194288-1	MW-12-05R_102523	83							
240-194288-2	MW-12-06_102523	72							
240-194288-3	MW-17-87_102523	84							
240-194288-4	MW-19-118D_102523	81							
240-194288-5	MW-19-118S_102523	77							
240-194288-6	MW-13-44_102523	86							
240-194288-7	MW-19-125_102523	92							
240-194288-8	DUP-06_102523	75							
LLCS 200-197484/2-A	Lab Control Sample	81							
MB 200-197484/1-A	Method Blank	79							

Surrogate Legend

DXE = 1,4-Dioxane-d8 (Surr)

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Lab Sample ID: MB 200-197484/1-A
Matrix: Water
Analysis Batch: 197594

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197484

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 17:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*79*		*46 - 130*	*11/14/23 17:00*	*11/16/23 17:54*	*1*

Lab Sample ID: LLCS 200-197484/2-A
Matrix: Water
Analysis Batch: 197594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197484

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits		
1,4-Dioxane			0.200	0.202		ug/L		101	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*81*		*46 - 130*

GC/MS Semi VOA

Prep Batch: 197484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194288-1	MW-12-05R_102523	Total/NA	Water	522	
240-194288-2	MW-12-06_102523	Total/NA	Water	522	
240-194288-3	MW-17-87_102523	Total/NA	Water	522	
240-194288-4	MW-19-118D_102523	Total/NA	Water	522	
240-194288-5	MW-19-118S_102523	Total/NA	Water	522	
240-194288-6	MW-13-44_102523	Total/NA	Water	522	
240-194288-7	MW-19-125_102523	Total/NA	Water	522	
240-194288-8	DUP-06_102523	Total/NA	Water	522	
MB 200-197484/1-A	Method Blank	Total/NA	Water	522	
LLCS 200-197484/2-A	Lab Control Sample	Total/NA	Water	522	

Analysis Batch: 197594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194288-1	MW-12-05R_102523	Total/NA	Water	522	197484
240-194288-2	MW-12-06_102523	Total/NA	Water	522	197484
240-194288-3	MW-17-87_102523	Total/NA	Water	522	197484
240-194288-4	MW-19-118D_102523	Total/NA	Water	522	197484
240-194288-5	MW-19-118S_102523	Total/NA	Water	522	197484
240-194288-6	MW-13-44_102523	Total/NA	Water	522	197484
240-194288-7	MW-19-125_102523	Total/NA	Water	522	197484
240-194288-8	DUP-06_102523	Total/NA	Water	522	197484
MB 200-197484/1-A	Method Blank	Total/NA	Water	522	197484
LLCS 200-197484/2-A	Lab Control Sample	Total/NA	Water	522	197484

Lab Chronicle

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-05R_102523

Lab Sample ID: 240-194288-1

Date Collected: 10/25/23 09:50
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 18:21

Client Sample ID: MW-12-06_102523

Lab Sample ID: 240-194288-2

Date Collected: 10/25/23 11:00
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 18:35

Client Sample ID: MW-17-87_102523

Lab Sample ID: 240-194288-3

Date Collected: 10/25/23 12:35
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 18:48

Client Sample ID: MW-19-118D_102523

Lab Sample ID: 240-194288-4

Date Collected: 10/25/23 11:10
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 19:02

Client Sample ID: MW-19-118S_102523

Lab Sample ID: 240-194288-5

Date Collected: 10/25/23 12:35
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/17/23 09:56

Client Sample ID: MW-13-44_102523

Lab Sample ID: 240-194288-6

Date Collected: 10/25/23 14:25
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 19:29

Lab Chronicle

Client: ARCADIS US Inc
Job ID: 240-194288-1
Project/Site: Racer Lansing

Client Sample ID: MW-19-125_102523
Lab Sample ID: 240-194288-7

Date Collected: 10/25/23 13:50
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 19:42

Client Sample ID: DUP-06_102523
Lab Sample ID: 240-194288-8

Date Collected: 10/25/23 00:00
Matrix: Water
Date Received: 10/26/23 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197484	KP	EET BUR	11/14/23 17:00
Total/NA	Analysis	522		1	197594	GGG	EET BUR	11/16/23 19:56

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS US Inc
Job ID: 240-194288-1
Project/Site: Racer Lansing

Laboratory: Eurofins Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-26
Connecticut	State	PH-0751	09-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-18-24
Florida	NELAP	E87467	06-30-24
Minnesota	NELAP	050-999-436	12-31-23
New Hampshire	NELAP	2006	12-18-23
New Jersey	NELAP	VT972	06-30-24
New York	NELAP	10391	03-31-24
Pennsylvania	NELAP	68-00489	04-30-24
Rhode Island	State	LAO00298	12-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
Vermont	State	VT4000	02-10-24
Virginia	NELAP	460209	12-14-23
Wisconsin	State	399140830	08-31-24

Eurofins Canton
180 S. Van Buren Ave

Barberton, OH 44203-3543
phone 330.497.9396 fax 330.497.0772

Chain of Custody Record

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Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Eurofins Environment Testing America

	Project Manager:		COC No:
Client Contact	Email: tiffany.linder@arcadis.com	**Site Contact: Kaitlyn Hunt**	**Date:**	_____ of _____ COCs
Arcadis	**Tel/Fax: (810) 225-1928**	**Lab Contact: Michael DelMonico**	**Carrier:**	TALS Project #:
28550 Cabot Drive, Suite 500	**Analysis Turnaround Time**			Sampler:
Novi, MI 48377	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(248) 994-2240 Phone	TAT if different from Below Standard			Walk-in Client:
tiffany.linder@arcadis.com, kaitlyn.hunt@arcadis.com	☐ 2 weeks			Lab Sampling:
Project Name: RACER Lansing/ 30171056.0470A	☐ 1 week			
Site: Plant 2	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	522 - 1,4-Dioxane	Sample Specific Notes:
MW-12-058_102523	10/25/23	0950	G	GW	1	N	N	X	
MW-12-06_102523	10/25/23	1100	G	GW	1	N	N	X	
MW-17-87_102523	10/25/23	1235	G	GW	1	N	N	X	
MW-19-118D_102523	10/25/23	1110	G	GW	1	N	N	X	
MW-19-118S_102523	10/25/23	1235	G	GW	1	N	N	X	
MW-13-44_102523	10/25/23	1425	G	GW	1	N	N	X	
MW-19-125_102523	10/25/23	1350	G	GW	1	N	N	X	
Dup-06_102523	10/25/23	—	G	GW	1	N	N	X	

240-194288 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: _____	Corr'd: _____	Therm ID No.: _____
Relinquished by:	Company: Arcadis	Date/Time: 10/25/23 16:00	Received by:	Company: ETNC	Date/Time: 10/26/23 950
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Eurofins – Cleveland Sample Receipt Form/Narrative Login # : 194288
Barberton Facility

Client Arcadis Site Name

Cooler Received on 10/26/23 Opened on 10/26/23

Cooler unpacked by: L Osborne

FedEx: 1st Grd (Exp) UPS FAS Waypoint Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # EC ~~Foam~~ Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN # 21 (CF -0.2 °C) Observed Cooler Temp. 2.2 °C Corrected Cooler Temp. 2.0 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity	~~Yes~~	No
-Were the seals on the outside of the cooler(s) signed & dated?	~~Yes~~	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	~~No~~
-Were tamper/custody seals intact and uncompromised?	~~Yes~~	No NA
3. Shippers' packing slip attached to the cooler(s)?	~~Yes~~	No
4. Did custody papers accompany the sample(s)?	~~Yes~~	No
5. Were the custody papers relinquished & signed in the appropriate place?	~~Yes~~	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	~~Yes~~	~~No~~
7. Did all bottles arrive in good condition (Unbroken)?	~~Yes~~	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	~~Yes~~	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	~~Yes~~	No
11. Sufficient quantity received to perform indicated analyses?	~~Yes~~	No
12. Are these work share samples and all listed on the COC?	Yes	~~No~~
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	~~NA~~ pH Strip Lot# HC316719
14. Were VOAs on the COC?	Yes	~~No~~
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes No	~~NA~~
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	~~No~~
17. Was a LL Hg or Me Hg trip blank present?	Yes	~~No~~

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

240-194288 Chain of Custody

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael		C No: 0-175830.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Michael.DelMonico@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-194288-1
Address: 530 Community Drive, Suite 11,	Due Date Requested: 11/13/2023			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing B0064480.2016.00603	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-12-05R_102523 (240-194288-1)	10/25/23	09:50 Eastern		Water			X	1	
MW-12-06_102523 (240-194288-2)	10/25/23	11:00 Eastern		Water			X	1	
MW-17-87_102523 (240-194288-3)	10/25/23	12:35 Eastern		Water			X	1	
MW-19_118D_102523 (240-194288-4)	10/25/23	10:10 Eastern		Water			X	1	
MW-19-118S_102523 (240-194288-5)	10/25/23	12:35 Eastern		Water			X	1	
MW-13-44_102523 (240-194288-6)	10/25/23	14:25 Eastern		Water			X	1	
MW-19-125_102523 (240-194288-7)	10/25/23	13:50 Eastern		Water			X	1	
DUP-06_102523 (240-194288-8)	10/25/23	Eastern		Water			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

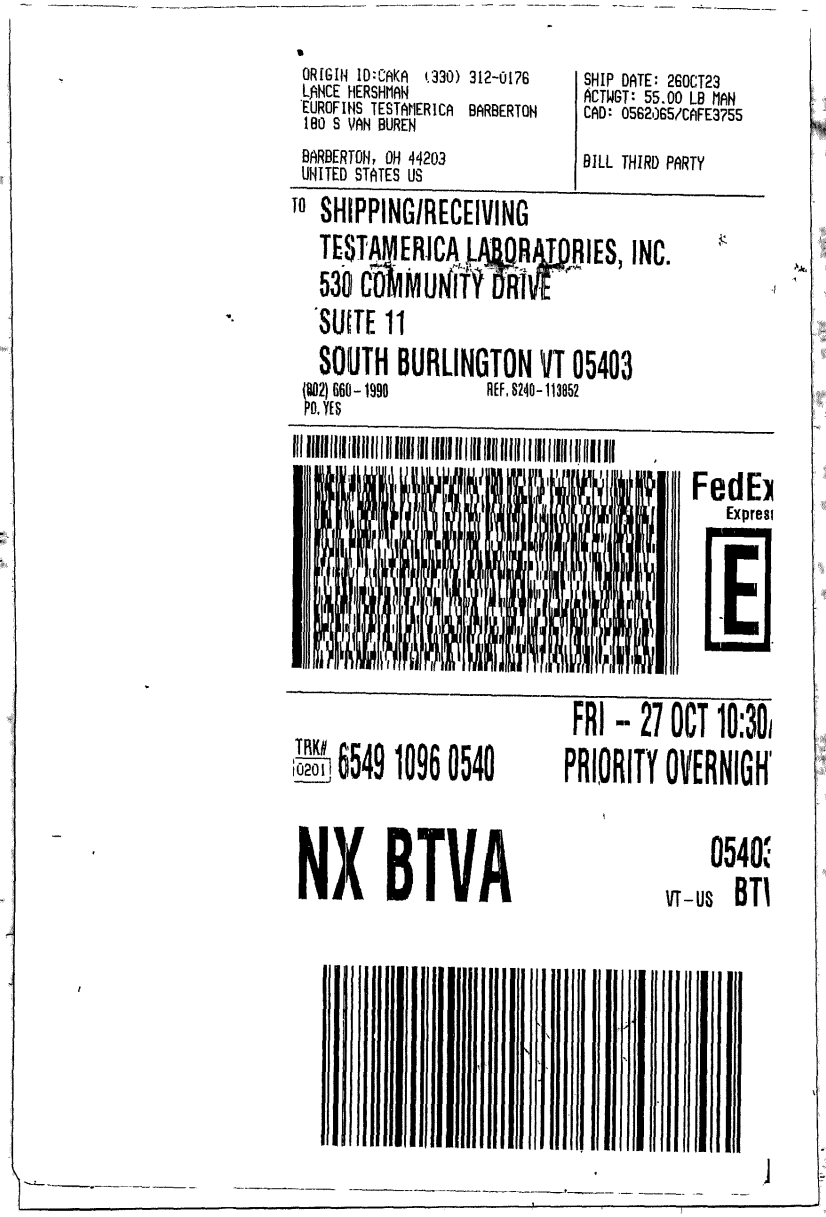
Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 10/26/23 1530	Company: ETNC	Received by:	Date/Time: 10/27/23 1030	Company: ETA Burl
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

11/18/2023



ORIGIN ID:CAKA (330) 312-0176
LANCE HERSHMAN
EUROFINS TESTAMERICA BARBERTON
180 S VAN BUREN

BARBERTON, OH 44203
UNITED STATES US

SHIP DATE: 26OCT23
ACTWGT: 55.00 LB MAN
CAD: 0562065/CAFE3755

BILL THIRD PARTY

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
530 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON VT 05403
(802) 660-1990 REF: 8240-113852
PO: YES

FedEx
Expres

TRK# 0201 6549 1096 0540

FRI - 27 OCT 10:30
PRIORITY OVERNIGH

NX BTVA

0540
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 240-194288-1

Login Number: 194288
List Number: 2
Creator: Muniz, Luca

List Source: Eurofins Burlington
List Creation: 10/27/23 02:18 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	Seals on cooler but date and time not filled out.
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.7ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Tiffany Linder
ARCADIS US Inc
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Generated 11/27/2023 3:07:54 PM

JOB DESCRIPTION

Racer Lansing

JOB NUMBER

240-194645-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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11/27/2023 3:07:54 PM

Authorized for release by
Michael DelMonico, Project Manager I
Michael.DelMonico@et.eurofinsus.com
(330)497-9396

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Definitions/Glossary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-194645-1

Laboratory: Eurofins Cleveland

Narrative

Job Narrative
240-194645-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/2/2023 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.7°C

GC/MS Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Method Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Method	Method Description	Protocol	Laboratory
522	1,4 Dioxane (GC/MS SIM)	EPA	EET BUR
522	Solid-Phase Extraction (SPE)	EPA	EET BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-194645-1	MW-19-119D_110123	Water	11/01/23 10:15	11/02/23 10:30
240-194645-2	MW-19-119S_110123	Water	11/01/23 11:15	11/02/23 10:30
240-194645-3	MW-13-28_110123	Water	11/01/23 12:40	11/02/23 10:30

Detection Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119D_110123 — Lab Sample ID: 240-194645-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.43		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-19-119S_110123 — Lab Sample ID: 240-194645-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.40		0.20	0.092	ug/L	1		522	Total/NA

Client Sample ID: MW-13-28_110123 — Lab Sample ID: 240-194645-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.83		0.20	0.092	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119D_110123
Date Collected: 11/01/23 10:15
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.43		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 18:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*98*		*46 - 130*	*11/21/23 10:00*	*11/22/23 18:49*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119S_110123
Date Collected: 11/01/23 11:15
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*	*11/21/23 10:00*	*11/22/23 19:29*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-13-28_110123
Date Collected: 11/01/23 12:40
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.83		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*	*11/21/23 10:00*	*11/22/23 19:43*	*1*

Surrogate Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)								
		DXE								
Lab Sample ID	Client Sample ID	(46-130)								
240-194645-1	MW-19-119D_110123	98								
240-194645-1 MS	MW-19-119D_110123	96								
240-194645-1 MSD	MW-19-119D_110123	99								
240-194645-2	MW-19-119S_110123	94								
240-194645-3	MW-13-28_110123	94								
LCS 200-197770/2-A	Lab Control Sample	94								
MB 200-197770/1-A	Method Blank	98								

Surrogate Legend

DXE = 1,4-Dioxane-d8 (Surr)

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Lab Sample ID: MB 200-197770/1-A
Matrix: Water
Analysis Batch: 197850

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 197770

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/21/23 10:00	11/22/23 16:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*98*		*46 - 130*	*11/21/23 10:00*	*11/22/23 16:46*	*1*

Lab Sample ID: LCS 200-197770/2-A
Matrix: Water
Analysis Batch: 197850

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 197770

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dioxane	8.00	7.92		ug/L		99	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*

Lab Sample ID: 240-194645-1 MS
Matrix: Water
Analysis Batch: 197850

Client Sample ID: MW-19-119D_110123
Prep Type: Total/NA
Prep Batch: 197770

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dioxane	0.43		2.00	2.45		ug/L		101	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*96*		*46 - 130*

Lab Sample ID: 240-194645-1 MSD
Matrix: Water
Analysis Batch: 197850

Client Sample ID: MW-19-119D_110123
Prep Type: Total/NA
Prep Batch: 197770

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dioxane	0.43		2.00	2.32		ug/L		95	70 - 130	5	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*99*		*46 - 130*

QC Association Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

GC/MS Semi VOA

Prep Batch: 197770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194645-1	MW-19-119D_110123	Total/NA	Water	522	
240-194645-2	MW-19-119S_110123	Total/NA	Water	522	
240-194645-3	MW-13-28_110123	Total/NA	Water	522	
MB 200-197770/1-A	Method Blank	Total/NA	Water	522	
LCS 200-197770/2-A	Lab Control Sample	Total/NA	Water	522	
240-194645-1 MS	MW-19-119D_110123	Total/NA	Water	522	
240-194645-1 MSD	MW-19-119D_110123	Total/NA	Water	522	

Analysis Batch: 197850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-194645-1	MW-19-119D_110123	Total/NA	Water	522	197770
240-194645-2	MW-19-119S_110123	Total/NA	Water	522	197770
240-194645-3	MW-13-28_110123	Total/NA	Water	522	197770
MB 200-197770/1-A	Method Blank	Total/NA	Water	522	197770
LCS 200-197770/2-A	Lab Control Sample	Total/NA	Water	522	197770
240-194645-1 MS	MW-19-119D_110123	Total/NA	Water	522	197770
240-194645-1 MSD	MW-19-119D_110123	Total/NA	Water	522	197770

Lab Chronicle

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119D_110123

Lab Sample ID: 240-194645-1

Date Collected: 11/01/23 10:15

Matrix: Water

Date Received: 11/02/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197770	DO	EET BUR	11/21/23 10:00
Total/NA	Analysis	522		1	197850	K1P	EET BUR	11/22/23 18:49

Client Sample ID: MW-19-119S_110123

Lab Sample ID: 240-194645-2

Date Collected: 11/01/23 11:15

Matrix: Water

Date Received: 11/02/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197770	DO	EET BUR	11/21/23 10:00
Total/NA	Analysis	522		1	197850	K1P	EET BUR	11/22/23 19:29

Client Sample ID: MW-13-28_110123

Lab Sample ID: 240-194645-3

Date Collected: 11/01/23 12:40

Matrix: Water

Date Received: 11/02/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	522			197770	DO	EET BUR	11/21/23 10:00
Total/NA	Analysis	522		1	197850	K1P	EET BUR	11/22/23 19:43

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Laboratory: Eurofins Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-26
Connecticut	State	PH-0751	09-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-18-24
Florida	NELAP	E87467	06-30-24
Minnesota	NELAP	050-999-436	12-31-23
New Hampshire	NELAP	2006	12-18-23
New Jersey	NELAP	VT972	06-30-24
New York	NELAP	10391	03-31-24
Pennsylvania	NELAP	68-00489	04-30-24
Rhode Island	State	LAO00298	12-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
Vermont	State	VT4000	02-10-24
Virginia	NELAP	460209	12-14-23
Wisconsin	State	399140830	08-31-24

4.5/4.7

PLANT-3

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Bill Cubeta	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-113370-40294.1
Client Contact: Alex Villhauer	Phone: 810-355-3642	E-Mail: Michael.DelMonico@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: ARCADIS US Inc	PWSID:			Job #:
Address: 120 N. Washington Square Suite 300 (3rd Floor)	Due Date Requested:			
City: Lansing	TAT Requested (days):			
State, Zip: MI, 48933	Compliance Project: Δ Yes Δ No			
Phone: 810-225-1928(Tel)	PO #: Purchase Order not required			
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001			
Project Name: Racer Lansing method 522	Project #: 24017406			
Site: 30171056-04708	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522-1,4-Dioxane	522 - Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A		
MW-19-1190-110123	11/1/23	1015	G	Water	N	N	X	X		
MW-19-1195-110123	11/1/23	1115	G	Water	N	N	X	X		
MW-13-28-110123	11/1/23	1240	G	Water	N	N	X	X		
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						

240-194645 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11-1-23 14:00	ARCADIS		11-2-23 10:20	
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Eurofins – Cleveland Sample Receipt Form/Narrative
Barberton Facility

Login # : 194645

Client ARCADIS Site Name

Cooler unpacked by: MLOCL

Cooler Received on 11-2-23 Opened on 11-2-23

FedEx: 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # CC Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN # 21 (CF +0.2 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.7 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC316719
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:


ORIGIN ID:LANA (810) 588-3642
BILLY COBERN
ARCADIS
28550 CABOT DR STE 500
NOVI, MI 48377
UNITED STATES US
SHIP DATE: 01NOV23
ACTWGT: 50.85 LB
CAD: 6994398/SSFE2441
DIMS: 24x14x14 IN
BILL THIRD PARTY
TO EUROFINS
EUROFINS
180 S VAN BUREN AVE
BARBERTON OH 44203
(330) 497-9396
INV:
PO:
REF:
DEPT:
FedEx
Express
REL#
3785346
THU - 02 NOV 5:00P
STANDARD OVERNIGHT
7858 2314 5890
IX CAKA
44203
OH-US CLE
RT 164
FZ
6
17:00
A
11.02
5890


240-194645 Waybill

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

240-194645 Chain of Custody

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael		COC No. 240-176156.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Michael.DelMonico@et.eurofinsus.com	State of Origin: Michigan	Page. Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-194645-1
Address: 530 Community Drive, Suite 11,	Due Date Requested: 11/15/2023			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing	Project #: 24017406			
Site	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-19-119D_110123 (240-194645-1)	11/1/23	10:15 Eastern		Water			X	2	
MW-19-119S_110123 (240-194645-2)	11/1/23	11:15 Eastern		Water			X	2	
MW-13-28_110123 (240-194645-3)	11/1/23	12:40 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Rochelle Arnold	Date/Time: 11/2/23 1705	Company: ETN	Received by:	Date/Time: 11/4/2023 9:25	Company: TAL BUR
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time.	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

11/27/2023



ORIGIN ID:CAKA (330) 312-0176
LANCE HERSHMAN
EUROFINS TESTAMERICA BARBERTON
180 S VAN BUREN

BARBERTON, OH 44203
UNITED STATES US

SHIP DATE: 02NOV23
ACTWGT: 40.00 LB MAN
CAD: 0562065/CAFE3755

BILL THIRD PARTY

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
530 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON VT 05403
(802) 660-1990 REF: 8240-114082
PO YES

FedEx
Express

TRK# 0201 6549 1096 5324

FRI - 03 NOV 10:30
PRIORITY OVERNIGHT

NX BTVA

05403
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 240-194645-1

Login Number: 194645
List Number: 2
Creator: Muniz, Luca

List Source: Eurofins Burlington
List Creation: 11/04/23 12:32 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Seals on cooler but date and time not filled out.
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Analytical Laboratory Report

Report ID: S54934.01(01)
Generated on 10/26/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
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John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S54934.01-S54934.10
Project: 30171056.0470A / RACER Lansing GWS
Collected Date(s): 10/24/2023
Submitted Date/Time: 10/24/2023 16:50
Sampled by: Austin Westhuis
P.O. #: US3460011441

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S54934.01	MW-23-161_102423	Groundwater	10/24/23 11:50
S54934.02	MW-23-162_102423	Groundwater	10/24/23 12:55
S54934.03	MW-23-163_102423	Groundwater	10/24/23 14:10
S54934.04	MW-22-155_102423	Groundwater	10/24/23 15:20
S54934.05	MW-14-58R_102423	Groundwater	10/24/23 13:00
S54934.06	MW-22-153_102423	Groundwater	10/24/23 14:00
S54934.07	MW-22-156_102423	Groundwater	10/24/23 15:15
S54934.08	MW-22-157_102423	Groundwater	10/24/23 16:30
S54934.09	DUP-03_102423	Groundwater	10/24/23 00:01
S54934.10	Trip Blank	Water	10/24/23 00:01

Analytical Laboratory Report

Lab Sample ID: S54934.01
Sample Tag: MW-23-161_102423
Collected Date/Time: 10/24/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 15:30, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	54	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 17:56, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.01 (continued)
Sample Tag: MW-23-161_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 17:56, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.02
Sample Tag: MW-23-162_102423
Collected Date/Time: 10/24/2023 12:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:02, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:15, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.02 (continued)
Sample Tag: MW-23-162_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:15, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.03
Sample Tag: MW-23-163_102423
Collected Date/Time: 10/24/2023 14:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:23, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	12	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:36, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.03 (continued)
Sample Tag: MW-23-163_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:36, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.04
Sample Tag: MW-22-155_102423
Collected Date/Time: 10/24/2023 15:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:44, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	176	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:56, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.04 (continued)
Sample Tag: MW-22-155_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:56, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.05
Sample Tag: MW-14-58R_102423
Collected Date/Time: 10/24/2023 13:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:05, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	194	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:15, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.05 (continued)
Sample Tag: MW-14-58R_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:15, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.06
Sample Tag: MW-22-153_102423
Collected Date/Time: 10/24/2023 14:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:27, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	101	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:34, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	37	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.06 (continued)
Sample Tag: MW-22-153_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:34, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.07
Sample Tag: MW-22-156_102423
Collected Date/Time: 10/24/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:48, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	140	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 21:12, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	20	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	280	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S54934.07 (continued)
Sample Tag: MW-22-156_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 21:12, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S54934.08
Sample Tag: MW-22-157_102423
Collected Date/Time: 10/24/2023 16:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 18:09, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	115	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:54, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.08 (continued)
Sample Tag: MW-22-157_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:54, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.09
Sample Tag: DUP-03_102423
Collected Date/Time: 10/24/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 18:29, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	56	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 20:13, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.09 (continued)
Sample Tag: DUP-03_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 20:13, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.10
Sample Tag: Trip Blank
Collected Date/Time: 10/24/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 14:58, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S54934.10 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 14:58, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Merit Laboratories Login Checklist

Lab Set ID: S54934
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing GWS
Submitted: 10/24/2023 16:50 Login User: PFD

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westmus / [signature]
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☒ OTHER RUSH 1 DAY
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
549341.01	10/24/23	1150	MW-23-161_102423	GW	3		3						✔	✔
.02	10/24/23	1255	MW-23-162_102423	GW	3		3						X	X
.03	10/24/23	1410	MW-23-163_102423	GW	3		3						X	X
.04	10/24/23	1520	MW-22-155_102423	GW	3		3						X	X
.05	10/24/23	1300	MW-14-58R_102423	GW	3		3						X	X
.06	10/24/23	1400	MW-22-153_102423	GW	3		3						X	X
.07	10/24/23	1515	MW-22-156_102423	GW	3		3						X	X
.08	10/24/23	1630	MW-22-157_102423	GW	3		3						X	X
.09	10/24/23	—	DUP-03_102423	GW	3		3						X	X
.10	10/24/23	—	Trip Blank	GW	1		1							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 10/24/23	TIME 1650

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S54934-01
Generated on 10/27/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S54934.01-S54934.10
Project: 30171056.0470A / RACER Lansing GWS
Submitted Date/Time: 10/24/2023 16:50
Sampled by: Austin Westhuis
P.O. #: US3460011441

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-11)
Prep Batch Summary (Page 12)
Surrogates per Lab Sample (Pages 13-22)
Surrogates per QC Sample (Pages 23-24)
Batch QC Results (Pages 25-30)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.



Barbara Ball
Quality Assurance Manager

Lab Sample ID: S54934.01
Sample Tag: MW-23-161_102423
Collected Date/Time: 10/24/2023 11:50
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 15:30	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 17:56	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S54934.02
Sample Tag: MW-23-162_102423
Collected Date/Time: 10/24/2023 12:55
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 16:02	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:15	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.03
Sample Tag: MW-23-163_102423
Collected Date/Time: 10/24/2023 14:10
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 16:23	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:36	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.04
Sample Tag: MW-22-155_102423
Collected Date/Time: 10/24/2023 15:20
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 16:44	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:56	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.05
Sample Tag: MW-14-58R_102423
Collected Date/Time: 10/24/2023 13:00
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 17:05	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:15	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.06

Sample Tag: MW-22-153_102423

Collected Date/Time: 10/24/2023 14:00

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 17:27	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:34	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.07

Sample Tag: MW-22-156_102423

Collected Date/Time: 10/24/2023 15:15

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 17:48	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 21:12	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.08

Sample Tag: MW-22-157_102423

Collected Date/Time: 10/24/2023 16:30

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 18:09	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:54	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.09

Sample Tag: DUP-03_102423

Collected Date/Time: 10/24/2023 00:01

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	10/26/23 18:29	231026A9	VS231026W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 20:13	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S54934.10

Sample Tag: Trip Blank

Collected Date/Time: 10/24/2023 00:01

Matrix: Water

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 14:58	231025A9	VF231025W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF231025W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S54934.01	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 17:56	231025A9
S54934.02	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:15	231025A9
S54934.03	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:36	231025A9
S54934.04	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 18:56	231025A9
S54934.05	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:15	231025A9
S54934.06	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:34	231025A9
S54934.07	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 21:12	231025A9
S54934.08	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 19:54	231025A9
S54934.09	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 20:13	231025A9
S54934.10	Volatile Organics - DEQ List	SW5030C/8260C	10/25/23 14:58	231025A9

Organics - Volatiles, Prep Batch ID: VS231026W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S54934.01	1,4-Dioxane	SW8260B - SIM	10/26/23 15:30	231026A9
S54934.02	1,4-Dioxane	SW8260B - SIM	10/26/23 16:02	231026A9
S54934.03	1,4-Dioxane	SW8260B - SIM	10/26/23 16:23	231026A9
S54934.04	1,4-Dioxane	SW8260B - SIM	10/26/23 16:44	231026A9
S54934.05	1,4-Dioxane	SW8260B - SIM	10/26/23 17:05	231026A9
S54934.06	1,4-Dioxane	SW8260B - SIM	10/26/23 17:27	231026A9
S54934.07	1,4-Dioxane	SW8260B - SIM	10/26/23 17:48	231026A9
S54934.08	1,4-Dioxane	SW8260B - SIM	10/26/23 18:09	231026A9
S54934.09	1,4-Dioxane	SW8260B - SIM	10/26/23 18:29	231026A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.01

Sample Tag: MW-23-161_102423

Collected Date/Time: 10/24/2023 11:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 17:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.1**	80.0	124.0
1,2-Dichloroethane-D4		**95.2**	72.0	125.0
Toluene-D8		**96.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.02

Sample Tag: MW-23-162_102423

Collected Date/Time: 10/24/2023 12:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 18:15, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**92.4**	80.0	124.0
1,2-Dichloroethane-D4		**88.5**	72.0	125.0
Toluene-D8		**96.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.03

Sample Tag: MW-23-163_102423

Collected Date/Time: 10/24/2023 14:10

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 18:36, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**93.1**	80.0	124.0
1,2-Dichloroethane-D4		**94.3**	72.0	125.0
Toluene-D8		**96.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.04

Sample Tag: MW-22-155_102423

Collected Date/Time: 10/24/2023 15:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 18:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.1**	72.0	125.0
Toluene-D8		**96.9**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.05

Sample Tag: MW-14-58R_102423

Collected Date/Time: 10/24/2023 13:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 19:15, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**93.9**	80.0	124.0
1,2-Dichloroethane-D4		**90.2**	72.0	125.0
Toluene-D8		**96.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.06

Sample Tag: MW-22-153_102423

Collected Date/Time: 10/24/2023 14:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 19:34, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.4**	80.0	124.0
1,2-Dichloroethane-D4		**95.2**	72.0	125.0
Toluene-D8		**96.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.07

Sample Tag: MW-22-156_102423

Collected Date/Time: 10/24/2023 15:15

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 21:12, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.6**	80.0	124.0
1,2-Dichloroethane-D4		**90.3**	72.0	125.0
Toluene-D8		**95.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.08

Sample Tag: MW-22-157_102423

Collected Date/Time: 10/24/2023 16:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 19:54, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.2**	80.0	124.0
1,2-Dichloroethane-D4		**93.6**	72.0	125.0
Toluene-D8		**96.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.09

Sample Tag: DUP-03_102423

Collected Date/Time: 10/24/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 20:13, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.4**	80.0	124.0
1,2-Dichloroethane-D4		**94.8**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S54934.10

Sample Tag: Trip Blank

Collected Date/Time: 10/24/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231025A9, Run Date: 10/25/2023 14:58, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**92.5**	80.0	124.0
1,2-Dichloroethane-D4		**87.4**	72.0	125.0
Toluene-D8		**95.2**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF231025W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231025A9.BLKW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 13:31, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**94.0**	80.0	124.0
1,2-Dichloroethane-D4		**89.5**	72.0	125.0
Toluene-D8		**95.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:12, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**94.4**	80.0	124.0
1,2-Dichloroethane-D4		**82.0**	72.0	125.0
Toluene-D8		**95.9**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231025A9.LCSDW25A, Parent Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:32, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.1**	80.0	124.0
1,2-Dichloroethane-D4		**88.6**	72.0	125.0
Toluene-D8		**96.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS231026W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231026A9.BLKS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 15:09, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 231026A9.LCSDS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 13:46, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231026A9.LCSDS26X, Parent Sample ID: 231026A9.LCSDS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 14:27, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Organics - Volatiles, Prep Batch ID: VF231025W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231025A9.BLKW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 13:31, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF231025W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 231025A9.BLKW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 13:31, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:12, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		102.6	67.4	121.2
Acetone		100.6	29.9	161.5
Methyl iodide		98.5	68.8	116.4
Carbon disulfide		103.5	63.8	137.4
tert-Methyl butyl ether (MTBE)		91.2	73.2	122.4
Acrylonitrile		116.9	69.9	128.9
2-Butanone (MEK)		118.8	44.0	134.4
Dichlorodifluoromethane		95.9	10.0	222.8
Chloromethane		97.6	23.8	166.5
Vinyl chloride		103.5	43.5	149.1
Bromomethane		103.0	56.8	151.3
Chloroethane		106.5	53.4	149.4
Trichlorofluoromethane		101.4	59.7	151.8
1,1-Dichloroethene		98.9	69.6	139.4
Methylene chloride		98.0	73.3	121.1
trans-1,2-Dichloroethene		97.9	73.6	129.3
1,1-Dichloroethane		99.5	71.5	126.2
cis-1,2-Dichloroethene		100.1	76.6	122.1
Tetrahydrofuran		103.4	59.0	117.9
Chloroform		99.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF231025W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:12, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		98.2	78.2	120.8
1,1,1-Trichloroethane		97.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		106.3	71.6	125.2
2-Hexanone		112.0	55.4	136.9
Carbon tetrachloride		106.7	72.6	133.0
Benzene		108.2	79.9	124.9
1,2-Dichloroethane		99.3	76.0	126.3
Trichloroethene		105.2	79.7	124.2
1,2-Dichloropropane		107.1	78.6	126.4
Bromodichloromethane		106.7	80.4	128.2
Dibromomethane		101.8	76.9	122.1
cis-1,3-Dichloropropene		104.9	79.8	129.9
Toluene		109.1	79.8	124.5
trans-1,3-Dichloropropene		103.5	74.0	131.3
1,1,2-Trichloroethane		108.2	78.7	123.1
Tetrachloroethene		105.9	74.5	124.5
trans-1,4-Dichloro-2-butene		104.7	68.6	135.4
Dibromochloromethane		104.7	74.6	127.2
1,2-Dibromoethane		107.8	70.3	133.7
Chlorobenzene		109.1	79.2	122.7
1,1,1,2-Tetrachloroethane		105.3	80.3	128.2
Ethylbenzene		109.3	79.5	129.1
p,m-Xylene		111.0	79.4	132.2
o-Xylene		108.3	80.2	131.0
Styrene		110.3	69.5	126.7
Isopropylbenzene		108.8	74.4	121.5
Bromoform		102.4	69.4	128.0
1,1,2,2-Tetrachloroethane		112.2	79.8	126.3
1,2,3-Trichloropropane		109.4	78.3	138.8
n-Propylbenzene		111.4	82.0	130.7
Bromobenzene		106.0	78.7	124.6
1,3,5-Trimethylbenzene		108.7	81.3	128.9
tert-Butylbenzene		106.5	80.7	128.9
1,2,4-Trimethylbenzene		107.6	81.4	130.8
sec-Butylbenzene		110.2	77.4	129.8
p-Isopropyltoluene		109.7	79.8	137.5
1,3-Dichlorobenzene		109.8	77.0	131.3
1,4-Dichlorobenzene		107.8	20.7	137.7
1,2-Dichlorobenzene		106.2	10.0	166.2
1,2,3-Trimethylbenzene		107.3	76.3	124.2
n-Butylbenzene		114.1	80.0	133.3
Hexachloroethane		102.9	23.8	138.1
1,2-Dibromo-3-chloropropane		107.4	21.2	189.4
1,2,4-Trichlorobenzene		104.7	27.4	143.4
1,2,3-Trichlorobenzene		105.6	75.4	131.4
Naphthalene		103.5	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF231025W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:12, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		92.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231025A9.LCSDW25A, Parent Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:32, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.9	67.4	121.2	5.0	30.0
Acetone		95.8	29.9	161.5	5.0	30.0
Methyl iodide		98.8	68.8	116.4	0.3	30.0
Carbon disulfide		101.0	63.8	137.4	2.5	30.0
tert-Methyl butyl ether (MTBE)		97.4	73.2	122.4	6.6	30.0
Acrylonitrile		119.2	69.9	128.9	2.0	30.0
2-Butanone (MEK)		119.5	44.0	134.4	0.6	30.0
Dichlorodifluoromethane		93.1	10.0	222.8	2.9	30.0
Chloromethane		97.9	23.8	166.5	0.3	30.0
Vinyl chloride		99.8	43.5	149.1	3.7	30.0
Bromomethane		103.2	56.8	151.3	0.2	30.0
Chloroethane		104.6	53.4	149.4	1.8	30.0
Trichlorofluoromethane		98.7	59.7	151.8	2.7	30.0
1,1-Dichloroethene		96.1	69.6	139.4	2.9	30.0
Methylene chloride		101.1	73.3	121.1	3.1	30.0
trans-1,2-Dichloroethene		98.3	73.6	129.3	0.4	30.0
1,1-Dichloroethane		99.1	71.5	126.2	0.4	30.0
cis-1,2-Dichloroethene		101.5	76.6	122.1	1.4	30.0
Tetrahydrofuran		101.5	59.0	117.9	1.8	30.0
Chloroform		100.2	78.4	124.0	1.0	30.0
Bromochloromethane		104.5	78.2	120.8	6.3	30.0
1,1,1-Trichloroethane		96.2	79.4	130.9	1.7	30.0
4-Methyl-2-pentanone (MIBK)		105.8	71.6	125.2	0.5	30.0
2-Hexanone		108.6	55.4	136.9	3.0	30.0
Carbon tetrachloride		102.9	72.6	133.0	3.6	30.0
Benzene		107.6	79.9	124.9	0.5	30.0
1,2-Dichloroethane		104.4	76.0	126.3	5.1	30.0
Trichloroethene		103.5	79.7	124.2	1.6	30.0
1,2-Dichloropropane		110.5	78.6	126.4	3.1	30.0
Bromodichloromethane		110.7	80.4	128.2	3.7	30.0
Dibromomethane		107.7	76.9	122.1	5.6	30.0
cis-1,3-Dichloropropene		109.3	79.8	129.9	4.1	30.0
Toluene		109.1	79.8	124.5	0.1	30.0
trans-1,3-Dichloropropene		108.7	74.0	131.3	4.9	30.0
1,1,2-Trichloroethane		114.6	78.7	123.1	5.7	30.0
Tetrachloroethene		103.3	74.5	124.5	2.5	30.0
trans-1,4-Dichloro-2-butene		103.2	68.6	135.4	1.5	30.0
Dibromochloromethane		108.3	74.6	127.2	3.3	30.0
1,2-Dibromoethane		111.5	70.3	133.7	3.4	30.0
Chlorobenzene		108.0	79.2	122.7	1.0	30.0

Organics - Volatiles, Prep Batch ID: VF231025W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 231025A9.LCSDW25A, Parent Sample ID: 231025A9.LCSW25A

Run in Batch: 231025A9, Run Date: 10/25/2023 12:32, Prep Date: 10/25/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		107.8	80.3	128.2	2.3	30.0
Ethylbenzene		106.9	79.5	129.1	2.2	30.0
p,m-Xylene		107.5	79.4	132.2	3.1	30.0
o-Xylene		108.0	80.2	131.0	0.3	30.0
Styrene		111.3	69.5	126.7	0.9	30.0
Isopropylbenzene		104.8	74.4	121.5	3.8	30.0
Bromoform		105.3	69.4	128.0	2.8	30.0
1,1,2,2-Tetrachloroethane		115.3	79.8	126.3	2.7	30.0
1,2,3-Trichloropropane		112.2	78.3	138.8	2.6	30.0
n-Propylbenzene		108.6	82.0	130.7	2.5	30.0
Bromobenzene		108.4	78.7	124.6	2.2	30.0
1,3,5-Trimethylbenzene		106.3	81.3	128.9	2.3	30.0
tert-Butylbenzene		102.7	80.7	128.9	3.7	30.0
1,2,4-Trimethylbenzene		106.8	81.4	130.8	0.8	30.0
sec-Butylbenzene		104.7	77.4	129.8	5.1	30.0
p-Isopropyltoluene		105.7	79.8	137.5	3.7	30.0
1,3-Dichlorobenzene		107.5	77.0	131.3	2.1	30.0
1,4-Dichlorobenzene		108.6	20.7	137.7	0.8	30.0
1,2-Dichlorobenzene		108.6	10.0	166.2	2.2	30.0
1,2,3-Trimethylbenzene		106.2	76.3	124.2	1.1	30.0
n-Butylbenzene		107.7	80.0	133.3	5.7	30.0
Hexachloroethane		99.5	23.8	138.1	3.3	30.0
1,2-Dibromo-3-chloropropane		105.6	21.2	189.4	1.7	30.0
1,2,4-Trichlorobenzene		105.1	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		105.6	75.4	131.4	0.1	30.0
Naphthalene		103.8	32.9	135.8	0.3	30.0
2-Methylnaphthalene		93.4	25.5	165.5	0.9	30.0

Organics - Volatiles, Prep Batch ID: VS231026W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231026A9.BLKS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 15:09, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.37	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231026A9.LCSDS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 13:46, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231026A9.LCSDS26X, Parent Sample ID: 231026A9.LCSDS26A

Run in Batch: 231026A9, Run Date: 10/26/2023 14:27, Prep Date: 10/26/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		89.0	70.0	130.0	4.7	30.0

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westmus / [signature]
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☒ OTHER RUSH 1 DAY
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
549341.01	10/24/23	1150	MW-23-161_102423	GW	3		3						✔	✔
.02	10/24/23	1255	MW-23-162_102423	GW	3		3						X	X
.03	10/24/23	1410	MW-23-163_102423	GW	3		3						X	X
.04	10/24/23	1520	MW-22-155_102423	GW	3		3						X	X
.05	10/24/23	1300	MW-14-58R_102423	GW	3		3						X	X
.06	10/24/23	1400	MW-22-153_102423	GW	3		3						X	X
.07	10/24/23	1515	MW-22-156_102423	GW	3		3						X	X
.08	10/24/23	1630	MW-22-157_102423	GW	3		3						X	X
.09	10/24/23	—	DUP-03_102423	GW	3		3						X	X
.10	10/24/23	—	Trip Blank	GW	1		1							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 10/24/23	TIME 1650

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55059.01(01)+QC01
Generated on 11/08/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55059.01-S55059.16
Project: 30171056.0470B / RACER Lansing GWS
Collected Date(s): 10/25/2023 - 10/26/2023
Submitted Date/Time: 10/27/2023 08:15
Sampled by: Donald Richmond
P.O. #: SEE SET NOTE

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SM4500-N/NH3 G	Standard Method 4500 N(org)B / 4500 NH3 G 2017
SM4500-NH3 G	Standard Method 4500 NH3 G 2017
SM4500-PE	Standard Method 4500 P E 2011 / 4500 P B(5) 2011
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (16 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55059.01	MW-14-61_102623	Groundwater	10/26/23 10:10
S55059.02	MW-19-121_102623	Groundwater	10/26/23 12:10
S55059.03	TW-15-12_102623	Groundwater	10/26/23 13:00
S55059.04	MW-19-123_102623	Groundwater	10/26/23 14:05
S55059.05	MW-20-128_102623	Groundwater	10/26/23 15:25
S55059.06	PW-14-02_102623	Groundwater	10/26/23 14:30
S55059.07	TW-14-02_102623	Groundwater	10/26/23 15:35
S55059.08	MW-20-127_102623	Groundwater	10/26/23 16:55
S55059.09	Dup-05_102623	Groundwater	10/26/23 00:01
S55059.10	MW-21-139_102523	Groundwater	10/25/23 12:05
S55059.11	P2-MW-04_102523	Groundwater	10/25/23 13:35
S55059.12	MW-14-59_102523	Groundwater	10/25/23 14:25
S55059.13	MW-14-60_102623	Groundwater	10/26/23 09:55
S55059.14	MW-14-62_102623	Groundwater	10/26/23 10:50
S55059.15	MW-14-57_102623	Groundwater	10/26/23 14:55
S55059.16	MW-16-76_102623	Groundwater	10/26/23 16:45

Lab Sample ID: S55059.01
Sample Tag: MW-14-61_102623
Collected Date/Time: 10/26/2023 10:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/03/23 12:15	NDK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:17, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.1	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 16:48, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:17, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.11	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 15:39, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	13	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 02:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	

Lab Sample ID: S55059.01 (continued)
Sample Tag: MW-14-61_102623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 02:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55059.01 (continued)

Sample Tag: MW-14-61_102623

Other / Misc.

Method: , Run Date: 10/27/23 15:35, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.02
Sample Tag: MW-19-121_102623
Collected Date/Time: 10/26/2023 12:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:21, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	1.3	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:16, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:23, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	10.3	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:00, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:39, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.03
Sample Tag: TW-15-12_102623
Collected Date/Time: 10/26/2023 13:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:23, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.3	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:18, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:26, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.12	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:21, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:40, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.04
Sample Tag: MW-19-123_102623
Collected Date/Time: 10/26/2023 14:05
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:25, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.1	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:20, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:31, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	39	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:41, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.05
Sample Tag: MW-20-128_102623
Collected Date/Time: 10/26/2023 15:25
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:31, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	6.7	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:22, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.03	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:35, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	3.3	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:03, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:43, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S55059.06
Sample Tag: PW-14-02_102623
Collected Date/Time: 10/26/2023 14:30
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:24, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.07
Sample Tag: TW-14-02_102623
Collected Date/Time: 10/26/2023 15:35
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 15:40, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S55059.08
Sample Tag: MW-20-127_102623
Collected Date/Time: 10/26/2023 16:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:47, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.7	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:24, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.54	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.05	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:46, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	132	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:44, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.09
Sample Tag: Dup-05_102623
Collected Date/Time: 10/26/2023 00:01
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:49, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	9.8	0.4		mg/L	20		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.06	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	112	12	11	mg/L	1,250	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:01, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:45, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S55059.10
Sample Tag: MW-21-139_102523
Collected Date/Time: 10/25/2023 12:05
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 14:37, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.11
Sample Tag: P2-MW-04_102523
Collected Date/Time: 10/25/2023 13:35
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 14:57, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	22	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.12
Sample Tag: MW-14-59_102523
Collected Date/Time: 10/25/2023 14:25
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 15:18, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.13
Sample Tag: MW-14-60_102623
Collected Date/Time: 10/26/2023 09:55
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 18:27, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.14
Sample Tag: MW-14-62_102623
Collected Date/Time: 10/26/2023 10:50
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 18:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	70	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.15
Sample Tag: MW-14-57_102623
Collected Date/Time: 10/26/2023 14:55
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.16
Sample Tag: MW-16-76_102623
Collected Date/Time: 10/26/2023 16:45
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:31, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55059.01(01)+QC01
Generated on 11/08/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55059.01-S55059.16
Project: 30171056.0470B / RACER Lansing GWS
Submitted Date/Time: 10/27/2023 08:15
Sampled by: Donald Richmond
P.O. #: SEE SET NOTE

QC Report Sections

Cover Page (Page 24)
Analysis Summary (Pages 25-40)
Prep Batch Summary (Pages 41-42)
Surrogates per Lab Sample (Page 43)
Surrogates per QC Sample (Pages 44-47)
Internal Standards per Lab Sample (Pages 48-63)
Internal Standards per QC Sample (Pages 64-67)
Batch QC Results (Pages 68-81)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S55059.01
Sample Tag: MW-14-61_102623
Collected Date/Time: 10/26/2023 10:10
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 16:48	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:17	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:17	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 15:39	231106A9	VS231106W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 02:51	231102B3	VF231102W4	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S55059.02
Sample Tag: MW-19-121_102623
Collected Date/Time: 10/26/2023 12:10
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:16	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:21	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:23	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 16:00	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.03
Sample Tag: TW-15-12_102623
Collected Date/Time: 10/26/2023 13:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:18	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:23	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:26	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 16:21	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.04
Sample Tag: MW-19-123_102623
Collected Date/Time: 10/26/2023 14:05
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:20	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:25	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:31	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 16:42	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.05
Sample Tag: MW-20-128_102623
Collected Date/Time: 10/26/2023 15:25
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:22	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:31	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:35	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 17:03	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.06
Sample Tag: PW-14-02_102623
Collected Date/Time: 10/26/2023 14:30
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 17:24	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.07
Sample Tag: TW-14-02_102623
Collected Date/Time: 10/26/2023 15:35
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 15:40	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55059.08

Sample Tag: MW-20-127_102623

Collected Date/Time: 10/26/2023 16:55

Matrix: Groundwater

COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:24	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:47	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:40	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 17:46	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55059.09

Sample Tag: Dup-05_102623

Collected Date/Time: 10/26/2023 00:01

Matrix: Groundwater

COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:40	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:49	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 16:57	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 16:01	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S55059.10
Sample Tag: MW-21-139_102523
Collected Date/Time: 10/25/2023 12:05
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 14:37	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55059.11
Sample Tag: P2-MW-04_102523
Collected Date/Time: 10/25/2023 13:35
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 14:57	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55059.12

Sample Tag: MW-14-59_102523

Collected Date/Time: 10/25/2023 14:25

Matrix: Groundwater

COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 15:18	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.13
Sample Tag: MW-14-60_102623
Collected Date/Time: 10/26/2023 09:55
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 18:27	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55059.14

Sample Tag: MW-14-62_102623

Collected Date/Time: 10/26/2023 10:50

Matrix: Groundwater

COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 18:49	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55059.15

Sample Tag: MW-14-57_102623

Collected Date/Time: 10/26/2023 14:55

Matrix: Groundwater

COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 19:10	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55059.16
Sample Tag: MW-16-76_102623
Collected Date/Time: 10/26/2023 16:45
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 19:31	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: AMN231102B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.01	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 16:48	AMN231102B
S55059.02	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:16	AMN231102B
S55059.03	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:18	AMN231102B
S55059.04	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:20	AMN231102B
S55059.05	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:22	AMN231102B
S55059.08	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:24	AMN231102B
S55059.09	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:40	AMN231102B

Inorganics, Prep Batch ID: PHS231031QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.01	Total Phosphorus	SM4500-PE	10/31/23 16:17	PHS231031QC
S55059.02	Total Phosphorus	SM4500-PE	10/31/23 16:23	PHS231031QC
S55059.03	Total Phosphorus	SM4500-PE	10/31/23 16:26	PHS231031QC
S55059.04	Total Phosphorus	SM4500-PE	10/31/23 16:31	PHS231031QC
S55059.05	Total Phosphorus	SM4500-PE	10/31/23 16:35	PHS231031QC
S55059.08	Total Phosphorus	SM4500-PE	10/31/23 16:40	PHS231031QC
S55059.09	Total Phosphorus	SM4500-PE	10/31/23 16:57	PHS231031QC

Inorganics, Prep Batch ID: TKN231103B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.01	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:17	TKN231103B
S55059.02	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:21	TKN231103B
S55059.03	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:23	TKN231103B
S55059.04	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:25	TKN231103B
S55059.05	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:31	TKN231103B
S55059.08	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:47	TKN231103B
S55059.09	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:49	TKN231103B

Organics - Volatiles, Prep Batch ID: VF231102W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.01	Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 02:51	231102B3

Organics - Volatiles, Prep Batch ID: VS231106W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.01	1,4-Dioxane	SW8260B - SIM	11/06/23 15:39	231106A9
S55059.02	1,4-Dioxane	SW8260B - SIM	11/06/23 16:00	231106A9
S55059.03	1,4-Dioxane	SW8260B - SIM	11/06/23 16:21	231106A9
S55059.04	1,4-Dioxane	SW8260B - SIM	11/06/23 16:42	231106A9
S55059.05	1,4-Dioxane	SW8260B - SIM	11/06/23 17:03	231106A9
S55059.06	1,4-Dioxane	SW8260B - SIM	11/06/23 17:24	231106A9
S55059.08	1,4-Dioxane	SW8260B - SIM	11/06/23 17:46	231106A9
S55059.10	1,4-Dioxane	SW8260B - SIM	11/06/23 14:37	231106A9
S55059.11	1,4-Dioxane	SW8260B - SIM	11/06/23 14:57	231106A9
S55059.12	1,4-Dioxane	SW8260B - SIM	11/06/23 15:18	231106A9
S55059.13	1,4-Dioxane	SW8260B - SIM	11/06/23 18:27	231106A9
S55059.14	1,4-Dioxane	SW8260B - SIM	11/06/23 18:49	231106A9

Organics - Volatiles, Prep Batch ID: VS231106W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.15	1,4-Dioxane	SW8260B - SIM	11/06/23 19:10	231106A9
S55059.16	1,4-Dioxane	SW8260B - SIM	11/06/23 19:31	231106A9

Organics - Volatiles, Prep Batch ID: VS231107W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55059.07	1,4-Dioxane	SW8260B - SIM	11/07/23 15:40	231107A9
S55059.09	1,4-Dioxane	SW8260B - SIM	11/07/23 16:01	231107A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55059.01

Sample Tag: MW-14-61_102623

Collected Date/Time: 10/26/2023 10:10

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231102B3, Run Date: 11/03/2023 02:51, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**101.1**	80.0	124.0
1,2-Dichloroethane-D4		**103.0**	72.0	125.0
Toluene-D8		**99.4**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF231102W4

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231102B3.BLKW02B

Run in Batch: 231102B3, Run Date: 11/03/2023 01:41, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.2**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:20, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.4**	80.0	124.0
1,2-Dichloroethane-D4		**91.4**	72.0	125.0
Toluene-D8		**99.3**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231102B3.LCSDW02B, Parent Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:44, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.4**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 231102B3.5506812M, Parent Sample ID: S55068.11

Run in Batch: 231102B3, Run Date: 11/03/2023 00:07, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.8**	80.0	124.0
1,2-Dichloroethane-D4		**89.6**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231102B3.5506813N, Parent Sample ID: 231102B3.5506812M

Run in Batch: 231102B3, Run Date: 11/03/2023 00:31, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.5**	80.0	124.0
1,2-Dichloroethane-D4		**92.3**	72.0	125.0
Toluene-D8		**99.9**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS231106W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS231107W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.01

Sample Tag: MW-14-61_102623

Collected Date/Time: 10/26/2023 10:10

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 15:39, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**89.2**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231102B3, Run Date: 11/03/2023 02:51, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**102.7**	50.0	200.0
1,4-Difluorobenzene		**106.6**	50.0	200.0
Chlorobenzene-D5		**109.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**104.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.02

Sample Tag: MW-19-121_102623

Collected Date/Time: 10/26/2023 12:10

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 16:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.03

Sample Tag: TW-15-12_102623

Collected Date/Time: 10/26/2023 13:00

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 16:21, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.04

Sample Tag: MW-19-123_102623

Collected Date/Time: 10/26/2023 14:05

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 16:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.05

Sample Tag: MW-20-128_102623

Collected Date/Time: 10/26/2023 15:25

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 17:03, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.06

Sample Tag: PW-14-02_102623

Collected Date/Time: 10/26/2023 14:30

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 17:24, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.07

Sample Tag: TW-14-02_102623

Collected Date/Time: 10/26/2023 15:35

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 15:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.08

Sample Tag: MW-20-127_102623

Collected Date/Time: 10/26/2023 16:55

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 17:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.09

Sample Tag: Dup-05_102623

Collected Date/Time: 10/26/2023 00:01

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 16:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.10

Sample Tag: MW-21-139_102523

Collected Date/Time: 10/25/2023 12:05

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 14:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.11

Sample Tag: P2-MW-04_102523

Collected Date/Time: 10/25/2023 13:35

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 14:57, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.12

Sample Tag: MW-14-59_102523

Collected Date/Time: 10/25/2023 14:25

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 15:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.13

Sample Tag: MW-14-60_102623

Collected Date/Time: 10/26/2023 09:55

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 18:27, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.14

Sample Tag: MW-14-62_102623

Collected Date/Time: 10/26/2023 10:50

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 18:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**105.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.15

Sample Tag: MW-14-57_102623

Collected Date/Time: 10/26/2023 14:55

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 19:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55059.16

Sample Tag: MW-16-76_102623

Collected Date/Time: 10/26/2023 16:45

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 19:31, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.9**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF231102W4

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231102B3.BLKW02B

Run in Batch: 231102B3, Run Date: 11/03/2023 01:41, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.9**	50.0	200.0
1,4-Difluorobenzene		**100.8**	50.0	200.0
Chlorobenzene-D5		**101.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:20, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.5**	50.0	200.0
1,4-Difluorobenzene		**97.9**	50.0	200.0
Chlorobenzene-D5		**97.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231102B3.LCSDW02B, Parent Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:44, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.6**	50.0	200.0
1,4-Difluorobenzene		**100.0**	50.0	200.0
Chlorobenzene-D5		**100.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**99.8**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231102B3.5506812M, Parent Sample ID: S55068.11

Run in Batch: 231102B3, Run Date: 11/03/2023 00:07, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.7**	50.0	200.0
1,4-Difluorobenzene		**100.5**	50.0	200.0
Chlorobenzene-D5		**100.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.7**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231102B3.5506813N, Parent Sample ID: 231102B3.5506812M

Run in Batch: 231102B3, Run Date: 11/03/2023 00:31, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.6**	50.0	200.0
1,4-Difluorobenzene		**97.2**	50.0	200.0
Chlorobenzene-D5		**98.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.6**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231106W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.9**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**110.5**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231107W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**114.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**95.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.7**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.7**	50.0	200.0

Inorganics, Prep Batch ID: AMN231102B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: AMN231102B.LRB1

Run in Batch: AMN231102B, Run Date: 11/02/2023 14:46, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Ammonia-N (Undistilled)		ND	0.02	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: AMN231102B.LCS1

Run in Batch: AMN231102B, Run Date: 11/02/2023 14:52, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		104.0	90	110

Matrix Spike (MS)

Lab Sample ID: AMN231102B.MS1, Parent Sample ID: S55059.01

Run in Batch: AMN231102B, Run Date: 11/02/2023 15:10, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		114.0	80	120

Duplicate (DUP)

Lab Sample ID: AMN231102B.DP1, Parent Sample ID: S55163.02

Run in Batch: AMN231102B, Run Date: 11/02/2023 16:54, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Ammonia-N (Undistilled)		0.0	20

Inorganics, Prep Batch ID: PHS231031QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS231031QC.LRB1

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:28, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS231031QC.LRB2

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:35, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS231031QC.LCS1

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:43, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		90	90	110

Matrix Spike (MS)

Lab Sample ID: PHS231031QC.MS1, Parent Sample ID: S54948.01

Run in Batch: PHS231031QC, Run Date: 10/31/2023 18:06, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		103	80	120

Duplicate (DUP)

Lab Sample ID: PHS231031QC.DP1, Parent Sample ID: S54908.02

Run in Batch: PHS231031QC, Run Date: 10/31/2023 18:03, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.9	20

Inorganics, Prep Batch ID: TKN231103B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN231103B.LRB1

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:03, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.025	mg/L

Blank (BLK)

Lab Sample ID: TKN231103B.LRB2

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:05, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN231103B.LCS1

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:09, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		100.7	90	110

Matrix Spike (MS)

Lab Sample ID: TKN231103B.MS1, Parent Sample ID: S55059.01

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103.8	80	120

Duplicate (DUP)

Lab Sample ID: TKN231103B.DP1, Parent Sample ID: S55181.01

Run in Batch: TKN231103B, Run Date: 11/03/2023 14:03, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 50

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		1.4	20

Organics - Volatiles, Prep Batch ID: VF231102W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231102B3.BLKW02B

Run in Batch: 231102B3, Run Date: 11/03/2023 01:41, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 231102B3.BLKW02B

Run in Batch: 231102B3, Run Date: 11/03/2023 01:41, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:20, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		95.4	67.4	121.2
Acetone		87.1	29.9	161.5
Methyl iodide		92.9	68.8	116.4
Carbon disulfide		92.1	63.8	137.4
tert-Methyl butyl ether (MTBE)		96.6	73.2	122.4
Acrylonitrile		101.8	69.9	128.9
2-Butanone (MEK)		89.5	44.0	134.4
Dichlorodifluoromethane		83.4	10.0	222.8
Chloromethane		87.5	23.8	166.5
Vinyl chloride		84.9	43.5	149.1
Bromomethane		89.9	56.8	151.3
Chloroethane		89.6	53.4	149.4
Trichlorofluoromethane		90.9	59.7	151.8
1,1-Dichloroethene		91.9	69.6	139.4
Methylene chloride		93.5	73.3	121.1
trans-1,2-Dichloroethene		92.3	73.6	129.3
1,1-Dichloroethane		92.9	71.5	126.2
cis-1,2-Dichloroethene		93.4	76.6	122.1
Tetrahydrofuran		95.6	59.0	117.9
Chloroform		92.9	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:20, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		95.1	78.2	120.8
1,1,1-Trichloroethane		94.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		95.6	71.6	125.2
2-Hexanone		96.3	55.4	136.9
Carbon tetrachloride		98.3	72.6	133.0
Benzene		98.4	79.9	124.9
1,2-Dichloroethane		97.4	76.0	126.3
Trichloroethene		96.9	79.7	124.2
1,2-Dichloropropane		99.2	78.6	126.4
Bromodichloromethane		100.7	80.4	128.2
Dibromomethane		102.2	76.9	122.1
cis-1,3-Dichloropropene		103.8	79.8	129.9
Toluene		99.4	79.8	124.5
trans-1,3-Dichloropropene		104.3	74.0	131.3
1,1,2-Trichloroethane		101.5	78.7	123.1
Tetrachloroethene		99.8	74.5	124.5
trans-1,4-Dichloro-2-butene		103.5	68.6	135.4
Dibromochloromethane		104.3	74.6	127.2
1,2-Dibromoethane		102.6	70.3	133.7
Chlorobenzene		100.1	79.2	122.7
1,1,1,2-Tetrachloroethane		103.5	80.3	128.2
Ethylbenzene		100.5	79.5	129.1
p,m-Xylene		100.5	79.4	132.2
o-Xylene		101.3	80.2	131.0
Styrene		100.1	69.5	126.7
Isopropylbenzene		102.5	74.4	121.5
Bromoform		106.3	69.4	128.0
1,1,2,2-Tetrachloroethane		103.2	79.8	126.3
1,2,3-Trichloropropane		102.6	78.3	138.8
n-Propylbenzene		102.9	82.0	130.7
Bromobenzene		102.0	78.7	124.6
1,3,5-Trimethylbenzene		102.4	81.3	128.9
tert-Butylbenzene		99.9	80.7	128.9
1,2,4-Trimethylbenzene		103.6	81.4	130.8
sec-Butylbenzene		100.1	77.4	129.8
p-Isopropyltoluene		101.2	79.8	137.5
1,3-Dichlorobenzene		100.9	77.0	131.3
1,4-Dichlorobenzene		99.1	20.7	137.7
1,2-Dichlorobenzene		100.5	10.0	166.2
1,2,3-Trimethylbenzene		101.6	76.3	124.2
n-Butylbenzene		101.8	80.0	133.3
Hexachloroethane		105.0	23.8	138.1
1,2-Dibromo-3-chloropropane		108.3	21.2	189.4
1,2,4-Trichlorobenzene		105.6	27.4	143.4
1,2,3-Trichlorobenzene		107.2	75.4	131.4
Naphthalene		108.9	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:20, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		107.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231102B3.LCSDW02B, Parent Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:44, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		90.1	67.4	121.2	5.7	30.0
Acetone		83.8	29.9	161.5	3.9	30.0
Methyl iodide		85.1	68.8	116.4	8.8	30.0
Carbon disulfide		83.2	63.8	137.4	10.1	30.0
tert-Methyl butyl ether (MTBE)		91.1	73.2	122.4	5.9	30.0
Acrylonitrile		95.3	69.9	128.9	6.7	30.0
2-Butanone (MEK)		85.1	44.0	134.4	5.0	30.0
Dichlorodifluoromethane		74.4	10.0	222.8	11.4	30.0
Chloromethane		77.9	23.8	166.5	11.6	30.0
Vinyl chloride		74.7	43.5	149.1	12.8	30.0
Bromomethane		81.7	56.8	151.3	9.6	30.0
Chloroethane		79.9	53.4	149.4	11.4	30.0
Trichlorofluoromethane		79.4	59.7	151.8	13.5	30.0
1,1-Dichloroethene		82.0	69.6	139.4	11.4	30.0
Methylene chloride		85.8	73.3	121.1	8.5	30.0
trans-1,2-Dichloroethene		82.2	73.6	129.3	11.6	30.0
1,1-Dichloroethane		84.2	71.5	126.2	9.8	30.0
cis-1,2-Dichloroethene		85.3	76.6	122.1	9.1	30.0
Tetrahydrofuran		90.2	59.0	117.9	5.9	30.0
Chloroform		84.6	78.4	124.0	9.3	30.0
Bromochloromethane		89.2	78.2	120.8	6.5	30.0
1,1,1-Trichloroethane		84.2	79.4	130.9	11.5	30.0
4-Methyl-2-pentanone (MIBK)		92.2	71.6	125.2	3.6	30.0
2-Hexanone		95.5	55.4	136.9	0.8	30.0
Carbon tetrachloride		87.7	72.6	133.0	11.4	30.0
Benzene		89.0	79.9	124.9	10.0	30.0
1,2-Dichloroethane		90.0	76.0	126.3	7.9	30.0
Trichloroethene		88.0	79.7	124.2	9.6	30.0
1,2-Dichloropropane		90.6	78.6	126.4	9.1	30.0
Bromodichloromethane		92.9	80.4	128.2	8.0	30.0
Dibromomethane		95.3	76.9	122.1	7.0	30.0
cis-1,3-Dichloropropene		95.9	79.8	129.9	8.0	30.0
Toluene		88.8	79.8	124.5	11.2	30.0
trans-1,3-Dichloropropene		97.6	74.0	131.3	6.6	30.0
1,1,2-Trichloroethane		94.3	78.7	123.1	7.4	30.0
Tetrachloroethene		88.4	74.5	124.5	12.2	30.0
trans-1,4-Dichloro-2-butene		96.9	68.6	135.4	6.6	30.0
Dibromochloromethane		97.2	74.6	127.2	7.0	30.0
1,2-Dibromoethane		96.8	70.3	133.7	5.9	30.0
Chlorobenzene		91.5	79.2	122.7	9.0	30.0

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 231102B3.LCSDW02B, Parent Sample ID: 231102B3.LCSW02B

Run in Batch: 231102B3, Run Date: 11/02/2023 23:44, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		94.5	80.3	128.2	9.0	30.0
Ethylbenzene		90.5	79.5	129.1	10.5	30.0
p,m-Xylene		90.2	79.4	132.2	10.8	30.0
o-Xylene		91.3	80.2	131.0	10.3	30.0
Styrene		91.0	69.5	126.7	9.5	30.0
Isopropylbenzene		92.1	74.4	121.5	10.7	30.0
Bromoform		98.5	69.4	128.0	7.6	30.0
1,1,2,2-Tetrachloroethane		97.6	79.8	126.3	5.6	30.0
1,2,3-Trichloropropane		97.9	78.3	138.8	4.6	30.0
n-Propylbenzene		92.3	82.0	130.7	10.9	30.0
Bromobenzene		93.8	78.7	124.6	8.4	30.0
1,3,5-Trimethylbenzene		92.9	81.3	128.9	9.7	30.0
tert-Butylbenzene		90.7	80.7	128.9	9.6	30.0
1,2,4-Trimethylbenzene		94.3	81.4	130.8	9.4	30.0
sec-Butylbenzene		88.8	77.4	129.8	11.9	30.0
p-Isopropyltoluene		90.0	79.8	137.5	11.6	30.0
1,3-Dichlorobenzene		91.8	77.0	131.3	9.5	30.0
1,4-Dichlorobenzene		90.6	20.7	137.7	8.9	30.0
1,2-Dichlorobenzene		92.3	10.0	166.2	8.6	30.0
1,2,3-Trimethylbenzene		92.8	76.3	124.2	9.1	30.0
n-Butylbenzene		90.5	80.0	133.3	11.8	30.0
Hexachloroethane		95.1	23.8	138.1	9.8	30.0
1,2-Dibromo-3-chloropropane		103.2	21.2	189.4	4.8	30.0
1,2,4-Trichlorobenzene		97.4	27.4	143.4	8.2	30.0
1,2,3-Trichlorobenzene		100.1	75.4	131.4	6.8	30.0
Naphthalene		102.6	32.9	135.8	6.0	30.0
2-Methylnaphthalene		102.9	25.5	165.5	4.4	30.0

Matrix Spike (MS)

Lab Sample ID: 231102B3.5506812M, Parent Sample ID: S55068.11

Run in Batch: 231102B3, Run Date: 11/03/2023 00:07, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		91.7	67.4	121.2
Acetone		83.7	29.9	161.5
Methyl iodide		89.4	68.8	116.4
Carbon disulfide		85.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		94.0	73.2	122.4
Acrylonitrile		95.2	69.9	128.9
2-Butanone (MEK)		85.7	44.0	134.4
Dichlorodifluoromethane		71.1	10.0	222.8
Chloromethane		77.9	23.8	166.5
Vinyl chloride		75.2	43.5	149.1
Bromomethane		84.2	56.8	151.3
Chloroethane		81.2	53.4	149.4
Trichlorofluoromethane		81.2	59.7	151.8
1,1-Dichloroethene		86.7	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 231102B3.5506812M, Parent Sample ID: S55068.11

Run in Batch: 231102B3, Run Date: 11/03/2023 00:07, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		89.3	73.3	121.1
trans-1,2-Dichloroethene		88.7	73.6	129.3
1,1-Dichloroethane		90.4	71.5	126.2
cis-1,2-Dichloroethene		90.4	76.6	122.1
Tetrahydrofuran		86.7	59.0	117.9
Chloroform		90.9	78.4	124.0
Bromochloromethane		92.6	78.2	120.8
1,1,1-Trichloroethane		91.0	79.4	130.9
4-Methyl-2-pentanone (MIBK)		93.1	71.6	125.2
2-Hexanone		94.6	55.4	136.9
Carbon tetrachloride		95.4	72.6	133.0
Benzene		95.6	79.9	124.9
1,2-Dichloroethane		96.2	76.0	126.3
Trichloroethene		96.9	79.7	124.2
1,2-Dichloropropane		97.6	78.6	126.4
Bromodichloromethane		99.2	80.4	128.2
Dibromomethane		98.8	76.9	122.1
cis-1,3-Dichloropropene		103.1	79.8	129.9
Toluene		96.7	79.8	124.5
trans-1,3-Dichloropropene		104.9	74.0	131.3
1,1,2-Trichloroethane		98.8	78.7	123.1
Tetrachloroethene		95.4	74.5	124.5
trans-1,4-Dichloro-2-butene		102.4	68.6	135.4
Dibromochloromethane		103.3	74.6	127.2
1,2-Dibromoethane		101.3	70.3	133.7
Chlorobenzene		99.4	79.2	122.7
1,1,1,2-Tetrachloroethane		103.2	80.3	128.2
Ethylbenzene		98.7	79.5	129.1
p,m-Xylene		99.1	79.4	132.2
o-Xylene		99.6	80.2	131.0
Styrene		99.4	69.5	126.7
Isopropylbenzene		100.5	74.4	121.5
Bromoform		103.3	69.4	128.0
1,1,2,2-Tetrachloroethane		100.2	79.8	126.3
1,2,3-Trichloropropane		99.4	78.3	138.8
n-Propylbenzene		100.2	82.0	130.7
Bromobenzene		99.6	78.7	124.6
1,3,5-Trimethylbenzene		99.5	81.3	128.9
tert-Butylbenzene		97.8	80.7	128.9
1,2,4-Trimethylbenzene		100.7	81.4	130.8
sec-Butylbenzene		98.8	77.4	129.8
p-Isopropyltoluene		100.2	79.8	137.5
1,3-Dichlorobenzene		99.3	77.0	131.3
1,4-Dichlorobenzene		98.0	20.7	137.7
1,2-Dichlorobenzene		100.0	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 231102B3.5506812M, Parent Sample ID: S55068.11

Run in Batch: 231102B3, Run Date: 11/03/2023 00:07, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		99.3	80.0	133.3
Hexachloroethane		103.7	23.8	138.1
1,2-Dibromo-3-chloropropane		104.1	21.2	189.4
1,2,4-Trichlorobenzene		102.8	27.4	143.4
1,2,3-Trichlorobenzene		104.0	75.4	131.4
Naphthalene		105.1	32.9	135.8
2-Methylnaphthalene		104.9	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231102B3.5506813N, Parent Sample ID: 231102B3.5506812M

Run in Batch: 231102B3, Run Date: 11/03/2023 00:31, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		81.8	67.4	121.2	11.4	30.0
Acetone		76.3	29.9	161.5	9.2	30.0
Methyl iodide		79.1	68.8	116.4	12.2	30.0
Carbon disulfide		75.4	63.8	137.4	12.9	30.0
tert-Methyl butyl ether (MTBE)		84.3	73.2	122.4	10.8	30.0
Acrylonitrile		84.3	69.9	128.9	12.1	30.0
2-Butanone (MEK)		75.6	44.0	134.4	12.5	30.0
Dichlorodifluoromethane		64.1	10.0	222.8	10.5	30.0
Chloromethane		68.9	23.8	166.5	12.2	30.0
Vinyl chloride		66.9	43.5	149.1	11.2	30.0
Bromomethane		74.7	56.8	151.3	11.9	30.0
Chloroethane		73.0	53.4	149.4	10.6	30.0
Trichlorofluoromethane		72.7	59.7	151.8	11.1	30.0
1,1-Dichloroethene		76.4	69.6	139.4	12.5	30.0
Methylene chloride		80.3	73.3	121.1	10.6	30.0
trans-1,2-Dichloroethene		79.0	73.6	129.3	11.7	30.0
1,1-Dichloroethane		79.8	71.5	126.2	12.1	30.0
cis-1,2-Dichloroethene		80.4	76.6	122.1	8.8	30.0
Tetrahydrofuran		77.1	59.0	117.9	11.7	30.0
Chloroform		80.2	78.4	124.0	12.5	30.0
Bromochloromethane		82.5	78.2	120.8	11.6	30.0
1,1,1-Trichloroethane		80.1	79.4	130.9	12.8	30.0
4-Methyl-2-pentanone (MIBK)		84.2	71.6	125.2	10.0	30.0
2-Hexanone		84.3	55.4	136.9	11.4	30.0
Carbon tetrachloride		84.2	72.6	133.0	12.5	30.0
Benzene		84.8	79.9	124.9	12.0	30.0
1,2-Dichloroethane		85.1	76.0	126.3	12.2	30.0
Trichloroethene		85.9	79.7	124.2	12.1	30.0
1,2-Dichloropropane		87.2	78.6	126.4	11.2	30.0
Bromodichloromethane		89.2	80.4	128.2	10.7	30.0
Dibromomethane		89.1	76.9	122.1	10.3	30.0
cis-1,3-Dichloropropene		90.6	79.8	129.9	12.9	30.0
Toluene		85.8	79.8	124.5	12.0	30.0
trans-1,3-Dichloropropene		92.9	74.0	131.3	12.1	30.0

Organics - Volatiles, Prep Batch ID: VF231102W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 231102B3.5506813N, Parent Sample ID: 231102B3.5506812M

Run in Batch: 231102B3, Run Date: 11/03/2023 00:31, Prep Date: 11/02/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane		88.7	78.7	123.1	10.8	30.0
Tetrachloroethene		84.6	74.5	124.5	12.0	30.0
trans-1,4-Dichloro-2-butene		89.2	68.6	135.4	13.8	30.0
Dibromochloromethane		90.7	74.6	127.2	13.0	30.0
1,2-Dibromoethane		89.4	70.3	133.7	12.4	30.0
Chlorobenzene		86.0	79.2	122.7	14.5	30.0
1,1,1,2-Tetrachloroethane		89.5	80.3	128.2	14.2	30.0
Ethylbenzene		86.3	79.5	129.1	13.4	30.0
p,m-Xylene		85.9	79.4	132.2	14.2	30.0
o-Xylene		86.8	80.2	131.0	13.8	30.0
Styrene		86.9	69.5	126.7	13.4	30.0
Isopropylbenzene		87.2	74.4	121.5	14.2	30.0
Bromoform		90.9	69.4	128.0	12.8	30.0
1,1,2,2-Tetrachloroethane		88.5	79.8	126.3	12.4	30.0
1,2,3-Trichloropropane		89.2	78.3	138.8	10.8	30.0
n-Propylbenzene		87.1	82.0	130.7	13.9	30.0
Bromobenzene		88.1	78.7	124.6	12.3	30.0
1,3,5-Trimethylbenzene		87.3	81.3	128.9	13.1	30.0
tert-Butylbenzene		85.6	80.7	128.9	13.4	30.0
1,2,4-Trimethylbenzene		88.9	81.4	130.8	12.4	30.0
sec-Butylbenzene		84.7	77.4	129.8	15.3	30.0
p-Isopropyltoluene		86.4	79.8	137.5	14.9	30.0
1,3-Dichlorobenzene		86.9	77.0	131.3	13.3	30.0
1,4-Dichlorobenzene		86.4	20.7	137.7	12.5	30.0
1,2-Dichlorobenzene		88.0	10.0	166.2	12.8	30.0
1,2,3-Trimethylbenzene		87.8	76.3	124.2	13.2	30.0
n-Butylbenzene		85.8	80.0	133.3	14.6	30.0
Hexachloroethane		91.5	23.8	138.1	12.5	30.0
1,2-Dibromo-3-chloropropane		91.2	21.2	189.4	13.3	30.0
1,2,4-Trichlorobenzene		91.2	27.4	143.4	11.9	30.0
1,2,3-Trichlorobenzene		92.8	75.4	131.4	11.3	30.0
Naphthalene		93.7	32.9	135.8	11.4	30.0
2-Methylnaphthalene		92.3	25.5	165.5	12.8	30.0

Organics - Volatiles, Prep Batch ID: VS231106W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.49	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.4	70.0	130.0	1.7	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VS231107W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.62	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		80.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		85.8	70.0	130.0	6.0	30.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.4	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.0	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.2	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		87.3	70.0	130.0	1.0	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		87.9	70.0	130.0	2.1	30.0

Organics - Volatiles, Prep Batch ID: VS231107W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		80.7	70.0	130.0	0.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55059
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing GWS
Submitted: 10/27/2023 08:15 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[X] Yes	[ ] No	[ ] N/A	Subcontracting needed? Subcontacted to:	Water Tech
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S55059 Submitted: 10/27/2023 08:15

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30171056.0470B / RACER Lansing GWS

Initial Preservation Check: 10/27/2023 08:57 MMC

Preservation Recheck (E200.8): N/A

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S55059.01	250ml Plastic H2SO4	<2			
S55059.02	250ml Plastic H2SO4	<2			
S55059.03	250ml Plastic H2SO4	<2			
S55059.04	250ml Plastic H2SO4	<2			
S55059.05	250ml Plastic H2SO4	<2			
S55059.08	250ml Plastic H2SO4	<2			
S55059.09	250ml Plastic H2SO4	<2			

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55059.01	10/26/23	1010	MW-14-61_102623	GW	5	1	3		1				X	X	X	X	X
.02	10/26/23	1210	MW-19-121_102623	GW	5	1	3		1				X	X		X	X
.03	10/26/23	1300	TW-15-12_102623	GW	5	1	3		1				X		X	X	X
.04	10/26/23	1405	MW-19-123_102623	GW	5	1	3		1				X		X	X	X
.05	10/26/23	1525	MW-20-128_102623	GW	5	1	3		1				X		X	X	X
.06	10/26/23	1430	PW-14-02_102623	GW	5	1	3		1				X				
.07	10/26/23	1535	TW-14-02_102623	GW	5	1	3		1				X				
.08	10/26/23	1655	MW-20-127_102623	GW	5	1	3		1				X		X	X	X
.09	10/26/23		DUP-05_102623	GW	5	1	3		1				X		X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis ☒ Sampler	DATE 10/26/23	TIME 1745
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/26/23	TIME 1745
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/27/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcott	DATE 10/27/23	TIME 0815
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55059.10	10/25/23	1205	MW-21-139_102523	GW	3		3						X	
.11	10/25/23	1335	P2-MW-04_102523	GW	3		3						X	
.12	10/25/23	1425	MW-14-59_102523	GW	3		3						X	
.13	10/26/23	0955	MW-14-60_102623	GW	3		3						X	
.14	10/26/23	1050	MW-14-62_102623	GW	3		3						X	
.15	10/26/23	1455	MW-14-57_102623	GW	3		3						X	
.16	10/26/23	1645	MW-16-76_102623	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ~~Sampler~~	DATE: 10/26/23	TIME: 1745	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 10/26/23	TIME: 1745	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 10/27/23	TIME: 0815	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Nicoob	DATE: 10/27/23	TIME: 0815	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 10:10
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.01

Lab Sample Number: 176408-01

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:35

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 12:10
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.02

Lab Sample Number: 176408-02

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	5.3	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:39

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 13:00
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.03

Lab Sample Number: 176408-03

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:40

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
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East Lansing, MI 48823

Date Sampled: 10/26/2023 14:05
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.04

Lab Sample Number: 176408-04

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	0.19	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:41

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
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CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 15:25
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.05

Lab Sample Number: 176408-05

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:43

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 16:55
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.08

Lab Sample Number: 176408-06

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:44

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 0:01
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.09

Lab Sample Number: 176408-07

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	6.0	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:45

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

Analytical Laboratory Report

Report ID: S55060.01(01)+QC01
Generated on 11/07/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55060.01-S55060.03
Project: 30171056.0470B / RACER Lansing GWS
Collected Date(s): 10/26/2023
Submitted Date/Time: 10/27/2023 08:15
Sampled by: Billy Cobern
P.O. #: US3460011467

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SM4500-N/NH3 G	Standard Method 4500 N(org)B / 4500 NH3 G 2017
SM4500-NH3 G	Standard Method 4500 NH3 G 2017
SM4500-PE	Standard Method 4500 P E 2011 / 4500 P B(5) 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55060.01	MW-13-29_102623	Groundwater	10/26/23 10:00
S55060.02	TW-14-06_102623	Groundwater	10/26/23 11:40
S55060.03	Dup-10_102623	Groundwater	10/26/23 00:01

Analytical Laboratory Report

Lab Sample ID: S55060.01
Sample Tag: MW-13-29_102623
Collected Date/Time: 10/26/2023 10:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:45, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.4	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:42, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.13	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:04, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:52, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:46, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55060.02
Sample Tag: TW-14-06_102623
Collected Date/Time: 10/26/2023 11:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:39, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.8	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:44, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:11, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.46	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 20:13, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:47, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55060.03
Sample Tag: Dup-10_102623
Collected Date/Time: 10/26/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.2	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:46, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.12	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:28, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 20:34, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:49, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Quality Control Report

Report ID: S55060.01(01)+QC01
Generated on 11/07/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55060.01-S55060.03
Project: 30171056.0470B / RACER Lansing GWS
Submitted Date/Time: 10/27/2023 08:15
Sampled by: Billy Cobern
P.O. #: US3460011467

QC Report Sections

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Analysis Summary (Pages 10-12)
Prep Batch Summary (Page 13)
Surrogates per QC Sample (Page 14)
Internal Standards per Lab Sample (Pages 15-17)
Internal Standards per QC Sample (Page 18)
Batch QC Results (Pages 19-22)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S55060.01
Sample Tag: MW-13-29_102623
Collected Date/Time: 10/26/2023 10:00
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:42	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:45	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 17:04	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 19:52	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55060.02
Sample Tag: TW-14-06_102623
Collected Date/Time: 10/26/2023 11:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:44	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:39	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 17:11	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 20:13	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55060.03
Sample Tag: Dup-10_102623
Collected Date/Time: 10/26/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:46	AMN231102B	AMN231102B	No	BLK/LCS/MS/DUP
Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:57	TKN231103B	TKN231103B	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	10/31/23 17:28	PHS231031QC	PHS231031QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/06/23 20:34	231106A9	VS231106W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: AMN231102B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55060.01	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:42	AMN231102B
S55060.02	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:44	AMN231102B
S55060.03	Ammonia-N (Undistilled)	SM4500-NH3 G	11/02/23 15:46	AMN231102B

Inorganics, Prep Batch ID: PHS231031QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55060.01	Total Phosphorus	SM4500-PE	10/31/23 17:04	PHS231031QC
S55060.02	Total Phosphorus	SM4500-PE	10/31/23 17:11	PHS231031QC
S55060.03	Total Phosphorus	SM4500-PE	10/31/23 17:28	PHS231031QC

Inorganics, Prep Batch ID: TKN231103B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55060.01	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 14:45	TKN231103B
S55060.02	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:39	TKN231103B
S55060.03	Total Kjeldahl Nitrogen	SM4500-N/NH3 G	11/03/23 13:57	TKN231103B

Organics - Volatiles, Prep Batch ID: VS231106W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55060.01	1,4-Dioxane	SW8260B - SIM	11/06/23 19:52	231106A9
S55060.02	1,4-Dioxane	SW8260B - SIM	11/06/23 20:13	231106A9
S55060.03	1,4-Dioxane	SW8260B - SIM	11/06/23 20:34	231106A9

Organics - Volatiles, Prep Batch ID: VS231106W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55060.01

Sample Tag: MW-13-29_102623

Collected Date/Time: 10/26/2023 10:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 19:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55060.02

Sample Tag: TW-14-06_102623

Collected Date/Time: 10/26/2023 11:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 20:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55060.03

Sample Tag: Dup-10_102623

Collected Date/Time: 10/26/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231106A9, Run Date: 11/06/2023 20:34, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.1**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231106W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.9**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**110.5**	50.0	200.0

Inorganics, Prep Batch ID: AMN231102B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: AMN231102B.LRB1

Run in Batch: AMN231102B, Run Date: 11/02/2023 14:46, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Ammonia-N (Undistilled)		ND	0.02	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: AMN231102B.LCS1

Run in Batch: AMN231102B, Run Date: 11/02/2023 14:52, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		104.0	90	110

Matrix Spike (MS)

Lab Sample ID: AMN231102B.MS1, Parent Sample ID: S55059.01

Run in Batch: AMN231102B, Run Date: 11/02/2023 15:10, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Ammonia-N (Undistilled)		114.0	80	120

Duplicate (DUP)

Lab Sample ID: AMN231102B.DP1, Parent Sample ID: S55163.02

Run in Batch: AMN231102B, Run Date: 11/02/2023 16:54, Prep Date: 11/02/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Ammonia-N (Undistilled)		0.0	20

Inorganics, Prep Batch ID: PHS231031QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS231031QC.LRB1

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:28, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS231031QC.LRB2

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:35, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS231031QC.LCS1

Run in Batch: PHS231031QC, Run Date: 10/31/2023 15:43, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		90	90	110

Matrix Spike (MS)

Lab Sample ID: PHS231031QC.MS1, Parent Sample ID: S54948.01

Run in Batch: PHS231031QC, Run Date: 10/31/2023 18:06, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		103	80	120

Duplicate (DUP)

Lab Sample ID: PHS231031QC.DP1, Parent Sample ID: S54908.02

Run in Batch: PHS231031QC, Run Date: 10/31/2023 18:03, Prep Date: 10/31/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.9	20

Inorganics, Prep Batch ID: TKN231103B

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN231103B.LRB1

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:03, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.025	mg/L

Blank (BLK)

Lab Sample ID: TKN231103B.LRB2

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:05, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN231103B.LCS1

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:09, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		100.7	90	110

Matrix Spike (MS)

Lab Sample ID: TKN231103B.MS1, Parent Sample ID: S55059.01

Run in Batch: TKN231103B, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 4

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103.8	80	120

Duplicate (DUP)

Lab Sample ID: TKN231103B.DP1, Parent Sample ID: S55181.01

Run in Batch: TKN231103B, Run Date: 11/03/2023 14:03, Prep Date: 11/03/2023, Matrix: Liquid, Dilution: 50

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		1.4	20

Organics - Volatiles, Prep Batch ID: VS231106W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231106A9.BLKS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 13:54, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.49	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:30, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231106A9.LCSDS06A, Parent Sample ID: 231106A9.LCSS06A

Run in Batch: 231106A9, Run Date: 11/06/2023 12:51, Prep Date: 11/06/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.4	70.0	130.0	1.7	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55060
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing GWS
Submitted: 10/27/2023 08:15 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[X] Yes	[ ] No	[ ] N/A	Subcontracting needed? Subcontacted to:	Water Tech
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S55060 Submitted: 10/27/2023 08:15

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30171056.0470B / RACER Lansing GWS

Initial Preservation Check: 10/27/2023 09:01 MMC

Preservation Recheck (E200.8): N/A

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S55060.01	250ml Plastic H2SO4	<2			
S55060.02	250ml Plastic H2SO4	<2			
S55060.03	250ml Plastic H2SO4	<2			

Plant 3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Colton

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55060.01	10/26/23	10:00	MW-13-29_102623	GW	5	1	3		1				X		X	X	X
.02	10/26/23	11:40	TW-14-06_102623	GW	5	1	3		1				X		X	X	X
.03	10/26/23	—	DUP-10_102623	GW	5	1	3		1				X		X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Arcadis ☒ Sampler	10/26/23	1745
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	10/26/23	1745
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit Drop Box	10/27/23	0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	10/27/23	0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 10:10
Date Received: 10/27/2023
Collected By:
Sample Point: S55060.01

Sample ID:
S55060
S55060.01

Lab Sample Number: 176409-01

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.30	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:46	MCL=10

Released By: NW **Date:** 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

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A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 12:10
Date Received: 10/27/2023
Collected By:
Sample Point: S550606.02

Sample ID:
S55060
S550606.02

Lab Sample Number: 176409-02

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.27	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:47	MCL=10

Released By: NW

Date: 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

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www.watertech-inc.com

WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 13:00
Date Received: 10/27/2023
Collected By:
Sample Point: S55060.03

Sample ID:
S55060
S55060.03

Lab Sample Number: 176409-03

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.32	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:49	MCL=10

Released By: NW **Date:** 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

Analytical Laboratory Report

Report ID: S55121.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55121.01-S55121.19
Project: 30171056.0470B / RACER Lansing GWS
Collected Date(s): 10/27/2023 - 10/28/2023
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Donald Richmond / Billy Cobern
P.O. #: US3460011467

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (19 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55121.01	MW-17-86_102723	Groundwater	10/27/23 09:55
S55121.02	MW-16-82_102723	Groundwater	10/27/23 10:50
S55121.03	MW-19-117_102723	Groundwater	10/27/23 12:35
S55121.04	MW-19-116_102723	Groundwater	10/27/23 13:50
S55121.05	MW-19-115_102723	Groundwater	10/27/23 15:00
S55121.06	MW-16-74_102723	Groundwater	10/27/23 16:00
S55121.07	MW-16-74_102723 MS	Groundwater	10/27/23 16:00
S55121.08	MW-16-74_102723 MSD	Groundwater	10/27/23 16:00
S55121.09	MW-16-81_102723	Groundwater	10/27/23 13:40
S55121.10	MW-15-72_102723	Groundwater	10/27/23 15:05
S55121.11	MW-13-43_102823	Groundwater	10/28/23 08:45
S55121.12	MW-19-120_102823	Groundwater	10/28/23 08:55
S55121.13	MW-13-45_102823	Groundwater	10/28/23 10:00
S55121.14	MW-16-84_102823	Groundwater	10/28/23 10:15
S55121.15	MW-16-84_102823 MS	Groundwater	10/28/23 10:15
S55121.16	MW-16-84_102823 MSD	Groundwater	10/28/23 10:15
S55121.17	MW-16-75_102823	Groundwater	10/28/23 11:35
S55121.18	MW-16-77_102823	Groundwater	10/28/23 13:05
S55121.19	MW-16-78_102823	Groundwater	10/28/23 14:10

Lab Sample ID: S55121.01
Sample Tag: MW-17-86_102723
Collected Date/Time: 10/27/2023 09:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:22, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	16	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.02
Sample Tag: MW-16-82_102723
Collected Date/Time: 10/27/2023 10:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:43, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.03
Sample Tag: MW-19-117_102723
Collected Date/Time: 10/27/2023 12:35
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.04
Sample Tag: MW-19-116_102723
Collected Date/Time: 10/27/2023 13:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:26, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.05
Sample Tag: MW-19-115_102723
Collected Date/Time: 10/27/2023 15:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:46, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.06
Sample Tag: MW-16-74_102723
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:08, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.07
Sample Tag: MW-16-74_102723 MS
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 20:56, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	46	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55121.08
Sample Tag: MW-16-74_102723 MSD
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 21:17, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	47	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55121.09
Sample Tag: MW-16-81_102723
Collected Date/Time: 10/27/2023 13:40
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:29, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	99	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.10
Sample Tag: MW-15-72_102723
Collected Date/Time: 10/27/2023 15:05
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:50, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	67	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.11
Sample Tag: MW-13-43_102823
Collected Date/Time: 10/28/2023 08:45
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:16, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.12
Sample Tag: MW-19-120_102823
Collected Date/Time: 10/28/2023 08:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 19:32, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	11	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 16:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S55121.12 (continued)
Sample Tag: MW-19-120_102823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 16:42, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S55121.13
Sample Tag: MW-13-45_102823
Collected Date/Time: 10/28/2023 10:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 19:53, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	25	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.14
Sample Tag: MW-16-84_102823
Collected Date/Time: 10/28/2023 10:15
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:29	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 20:14, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	39	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 17:05, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S55121.14 (continued)
Sample Tag: MW-16-84_102823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 17:05, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55121.15
Sample Tag: MW-16-84_102823 MS
Collected Date/Time: 10/28/2023 10:15
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:29	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 21:38, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	80	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 21:46, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	53	10		ug/L	1	60-29-7	2
Acetone	Not detected	50		ug/L	1	67-64-1	2
Methyl iodide	51	1		ug/L	1	74-88-4	2
Carbon disulfide	44	5		ug/L	1	75-15-0	2
tert-Methyl butyl ether (MTBE)	54	5		ug/L	1	1634-04-4	2
Acrylonitrile	54	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	51	25		ug/L	1	78-93-3	2
Dichlorodifluoromethane	49	5		ug/L	1	75-71-8	2
Chloromethane	51	5		ug/L	1	74-87-3	2
Vinyl chloride	48	1		ug/L	1	75-01-4	2
Bromomethane	45	5		ug/L	1	74-83-9	2
Chloroethane	45	5		ug/L	1	75-00-3	2
Trichlorofluoromethane	42	1		ug/L	1	75-69-4	2
1,1-Dichloroethene	50	1		ug/L	1	75-35-4	2
Methylene chloride	51	5		ug/L	1	75-09-2	2
trans-1,2-Dichloroethene	50	1		ug/L	1	156-60-5	2
1,1-Dichloroethane	53	1		ug/L	1	75-34-3	2
cis-1,2-Dichloroethene	52	1		ug/L	1	156-59-2	2
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	2
Chloroform	51	1		ug/L	1	67-66-3	2
Bromochloromethane	52	1		ug/L	1	74-97-5	2
1,1,1-Trichloroethane	47	1		ug/L	1	71-55-6	2
4-Methyl-2-pentanone (MIBK)	51	50		ug/L	1	108-10-1	2
2-Hexanone	52	50		ug/L	1	591-78-6	2
Carbon tetrachloride	46	1		ug/L	1	56-23-5	2
Benzene	50	1		ug/L	1	71-43-2	2
1,2-Dichloroethane	50	1		ug/L	1	107-06-2	2
Trichloroethene	50	1		ug/L	1	79-01-6	2
1,2-Dichloropropane	52	1		ug/L	1	78-87-5	2
Bromodichloromethane	51	1		ug/L	1	75-27-4	2
Dibromomethane	52	5		ug/L	1	74-95-3	2

1-Spiked at 50ug/L
2-Spiked at 50 ug/L

Lab Sample ID: S55121.15 (continued)
Sample Tag: MW-16-84_102823 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 21:46, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
cis-1,3-Dichloropropene	54	1		ug/L	1	10061-01-5	1
Toluene	49	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	52	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	52	1		ug/L	1	79-00-5	1
Tetrachloroethene	49	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	48	1		ug/L	1	110-57-6	1
Dibromochloromethane	50	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	50	1		ug/L	1	106-93-4	1
Chlorobenzene	48	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	50	1		ug/L	1	630-20-6	1
Ethylbenzene	48	1		ug/L	1	100-41-4	1
p,m-Xylene*	95	2		ug/L	1		1
o-Xylene	48	1		ug/L	1	95-47-6	1
Styrene	48	1		ug/L	1	100-42-5	1
Isopropylbenzene	47	5		ug/L	1	98-82-8	1
Bromoform	49	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	48	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	48	1		ug/L	1	96-18-4	1
n-Propylbenzene	47	1		ug/L	1	103-65-1	1
Bromobenzene	49	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	47	1		ug/L	1	108-67-8	1
tert-Butylbenzene	46	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	47	1		ug/L	1	95-63-6	1
sec-Butylbenzene	46	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	46	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	47	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	48	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	49	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	47	1		ug/L	1	526-73-8	1
n-Butylbenzene	46	1		ug/L	1	104-51-8	1
Hexachloroethane	49	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	50	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	50	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	50	5		ug/L	1	87-61-6	1
Naphthalene	49	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	39	5		ug/L	1	91-57-6	1

1-Spiked at 50 ug/L

Lab Sample ID: S55121.16
Sample Tag: MW-16-84_102823 MSD
Collected Date/Time: 10/28/2023 10:15
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:29	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 21:59, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	79	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 22:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	51	10		ug/L	1	60-29-7	2
Acetone	52	50		ug/L	1	67-64-1	2
Methyl iodide	49	1		ug/L	1	74-88-4	2
Carbon disulfide	42	5		ug/L	1	75-15-0	2
tert-Methyl butyl ether (MTBE)	52	5		ug/L	1	1634-04-4	2
Acrylonitrile	58	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	56	25		ug/L	1	78-93-3	2
Dichlorodifluoromethane	49	5		ug/L	1	75-71-8	2
Chloromethane	49	5		ug/L	1	74-87-3	2
Vinyl chloride	47	1		ug/L	1	75-01-4	2
Bromomethane	44	5		ug/L	1	74-83-9	2
Chloroethane	43	5		ug/L	1	75-00-3	2
Trichlorofluoromethane	40	1		ug/L	1	75-69-4	2
1,1-Dichloroethene	45	1		ug/L	1	75-35-4	2
Methylene chloride	47	5		ug/L	1	75-09-2	2
trans-1,2-Dichloroethene	47	1		ug/L	1	156-60-5	2
1,1-Dichloroethane	50	1		ug/L	1	75-34-3	2
cis-1,2-Dichloroethene	49	1		ug/L	1	156-59-2	2
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	2
Chloroform	48	1		ug/L	1	67-66-3	2
Bromochloromethane	48	1		ug/L	1	74-97-5	2
1,1,1-Trichloroethane	45	1		ug/L	1	71-55-6	2
4-Methyl-2-pentanone (MIBK)	58	50		ug/L	1	108-10-1	2
2-Hexanone	59	50		ug/L	1	591-78-6	2
Carbon tetrachloride	44	1		ug/L	1	56-23-5	2
Benzene	48	1		ug/L	1	71-43-2	2
1,2-Dichloroethane	47	1		ug/L	1	107-06-2	2
Trichloroethene	48	1		ug/L	1	79-01-6	2
1,2-Dichloropropane	50	1		ug/L	1	78-87-5	2
Bromodichloromethane	49	1		ug/L	1	75-27-4	2
Dibromomethane	51	5		ug/L	1	74-95-3	2

1-Spiked at 50ug/L
2-Spiked at 50 ug/L

Lab Sample ID: S55121.16 (continued)
Sample Tag: MW-16-84_102823 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 22:10, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
cis-1,3-Dichloropropene	52	1		ug/L	1	10061-01-5	1
Toluene	47	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	51	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	50	1		ug/L	1	79-00-5	1
Tetrachloroethene	48	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	51	1		ug/L	1	110-57-6	1
Dibromochloromethane	49	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	51	1		ug/L	1	106-93-4	1
Chlorobenzene	47	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	48	1		ug/L	1	630-20-6	1
Ethylbenzene	47	1		ug/L	1	100-41-4	1
p,m-Xylene*	93	2		ug/L	1		1
o-Xylene	46	1		ug/L	1	95-47-6	1
Styrene	46	1		ug/L	1	100-42-5	1
Isopropylbenzene	46	5		ug/L	1	98-82-8	1
Bromoform	51	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	51	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	52	1		ug/L	1	96-18-4	1
n-Propylbenzene	47	1		ug/L	1	103-65-1	1
Bromobenzene	47	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	46	1		ug/L	1	108-67-8	1
tert-Butylbenzene	46	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	46	1		ug/L	1	95-63-6	1
sec-Butylbenzene	47	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	46	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	47	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	47	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	47	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	47	1		ug/L	1	526-73-8	1
n-Butylbenzene	47	1		ug/L	1	104-51-8	1
Hexachloroethane	51	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	61	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	51	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	53	5		ug/L	1	87-61-6	1
Naphthalene	57	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	53	5		ug/L	1	91-57-6	1

1-Spiked at 50 ug/L

Lab Sample ID: S55121.17
Sample Tag: MW-16-75_102823
Collected Date/Time: 10/28/2023 11:35
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:07, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.18
Sample Tag: MW-16-77_102823
Collected Date/Time: 10/28/2023 13:05
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:28, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.19
Sample Tag: MW-16-78_102823
Collected Date/Time: 10/28/2023 14:10
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55121.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55121.01-S55121.19
Project: 30171056.0470B / RACER Lansing GWS
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Donald Richmond / Billy Cobern
P.O. #: US3460011467

QC Report Sections

Cover Page (Page 29)
Analysis Summary (Pages 30-48)
Prep Batch Summary (Page 49)
Surrogates per Lab Sample (Pages 50-51)
Surrogates per QC Sample (Pages 52-57)
Internal Standards per Lab Sample (Pages 58-72)
Internal Standards per QC Sample (Pages 73-78)
Batch QC Results (Pages 79-93)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55121.01
Sample Tag: MW-17-86_102723
Collected Date/Time: 10/27/2023 09:55
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 16:22	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.02
Sample Tag: MW-16-82_102723
Collected Date/Time: 10/27/2023 10:50
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 16:43	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.03
Sample Tag: MW-19-117_102723
Collected Date/Time: 10/27/2023 12:35
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 17:04	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.04
Sample Tag: MW-19-116_102723
Collected Date/Time: 10/27/2023 13:50
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 17:26	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.05
Sample Tag: MW-19-115_102723
Collected Date/Time: 10/27/2023 15:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 17:46	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.06
Sample Tag: MW-16-74_102723
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 18:08	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.07
Sample Tag: MW-16-74_102723 MS
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 20:56	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.08
Sample Tag: MW-16-74_102723 MSD
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 21:17	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.09
Sample Tag: MW-16-81_102723
Collected Date/Time: 10/27/2023 13:40
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 18:29	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.10
Sample Tag: MW-15-72_102723
Collected Date/Time: 10/27/2023 15:05
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 18:50	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.11
Sample Tag: MW-13-43_102823
Collected Date/Time: 10/28/2023 08:45
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 15:16	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.12

Sample Tag: MW-19-120_102823

Collected Date/Time: 10/28/2023 08:55

Matrix: Groundwater

COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 19:32	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 16:42	231107A7	VF231107W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.13
Sample Tag: MW-13-45_102823
Collected Date/Time: 10/28/2023 10:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 19:53	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.14
Sample Tag: MW-16-84_102823
Collected Date/Time: 10/28/2023 10:15
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 20:14	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 17:05	231107A7	VF231107W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.15

Sample Tag: MW-16-84_102823 MS

Collected Date/Time: 10/28/2023 10:15

Matrix: Groundwater

COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 21:38	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 21:46	231107A7	VF231107W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.16

Sample Tag: MW-16-84_102823 MSD

Collected Date/Time: 10/28/2023 10:15

Matrix: Groundwater

COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/07/23 21:59	231107A9	VS231107W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 22:10	231107A7	VF231107W2	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55121.17
Sample Tag: MW-16-75_102823
Collected Date/Time: 10/28/2023 11:35
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 01:07	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55121.18
Sample Tag: MW-16-77_102823
Collected Date/Time: 10/28/2023 13:05
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 01:28	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55121.19
Sample Tag: MW-16-78_102823
Collected Date/Time: 10/28/2023 14:10
Matrix: Groundwater
COC Reference: 2

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 01:49	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF231107W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55121.12	Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 16:42	231107A7
S55121.14	Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 17:05	231107A7
S55121.15	Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 21:46	231107A7
S55121.16	Volatile Organics - DEQ List	SW5030C/8260C	11/07/23 22:10	231107A7

Organics - Volatiles, Prep Batch ID: VS231107W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55121.01	1,4-Dioxane	SW8260B - SIM	11/07/23 16:22	231107A9
S55121.02	1,4-Dioxane	SW8260B - SIM	11/07/23 16:43	231107A9
S55121.03	1,4-Dioxane	SW8260B - SIM	11/07/23 17:04	231107A9
S55121.04	1,4-Dioxane	SW8260B - SIM	11/07/23 17:26	231107A9
S55121.05	1,4-Dioxane	SW8260B - SIM	11/07/23 17:46	231107A9
S55121.06	1,4-Dioxane	SW8260B - SIM	11/07/23 18:08	231107A9
S55121.07	1,4-Dioxane	SW8260B - SIM	11/07/23 20:56	231107A9
S55121.08	1,4-Dioxane	SW8260B - SIM	11/07/23 21:17	231107A9
S55121.09	1,4-Dioxane	SW8260B - SIM	11/07/23 18:29	231107A9
S55121.10	1,4-Dioxane	SW8260B - SIM	11/07/23 18:50	231107A9
S55121.12	1,4-Dioxane	SW8260B - SIM	11/07/23 19:32	231107A9
S55121.13	1,4-Dioxane	SW8260B - SIM	11/07/23 19:53	231107A9
S55121.14	1,4-Dioxane	SW8260B - SIM	11/07/23 20:14	231107A9
S55121.15	1,4-Dioxane	SW8260B - SIM	11/07/23 21:38	231107A9
S55121.16	1,4-Dioxane	SW8260B - SIM	11/07/23 21:59	231107A9

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55121.17	1,4-Dioxane	SW8260B - SIM	11/08/23 01:07	231107B9
S55121.18	1,4-Dioxane	SW8260B - SIM	11/08/23 01:28	231107B9
S55121.19	1,4-Dioxane	SW8260B - SIM	11/08/23 01:49	231107B9

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55121.11	1,4-Dioxane	SW8260B - SIM	11/09/23 15:16	231109A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55121.12

Sample Tag: MW-19-120_102823

Collected Date/Time: 10/28/2023 08:55

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231107A7, Run Date: 11/07/2023 16:42, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**99.1**	80.0	124.0
1,2-Dichloroethane-D4		**104.1**	72.0	125.0
Toluene-D8		**93.9**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55121.14

Sample Tag: MW-16-84_102823

Collected Date/Time: 10/28/2023 10:15

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231107A7, Run Date: 11/07/2023 17:05, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.8**	80.0	124.0
1,2-Dichloroethane-D4		**93.0**	72.0	125.0
Toluene-D8		**93.8**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF231107W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A7.BLKW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 14:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.7**	80.0	124.0
1,2-Dichloroethane-D4		**102.9**	72.0	125.0
Toluene-D8		**95.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:11, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.4**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**96.1**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A7.LCSDW07A, Parent Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:35, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.5**	80.0	124.0
1,2-Dichloroethane-D4		**98.6**	72.0	125.0
Toluene-D8		**95.6**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 231107A7.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A7, Run Date: 11/07/2023 21:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**98.9**	80.0	124.0
1,2-Dichloroethane-D4		**100.4**	72.0	125.0
Toluene-D8		**94.8**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 231107A7.5533602M, Parent Sample ID: S55336.01

Run in Batch: 231107A7, Run Date: 11/07/2023 22:33, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.8**	80.0	124.0
1,2-Dichloroethane-D4		**97.1**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5512116N, Parent Sample ID: 231107A7.5512115M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:10, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.8**	80.0	124.0
1,2-Dichloroethane-D4		**96.2**	72.0	125.0
Toluene-D8		**95.7**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5533603N, Parent Sample ID: 231107A7.5533602M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:57, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.1**	80.0	124.0
1,2-Dichloroethane-D4		**99.2**	72.0	125.0
Toluene-D8		**96.3**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS231107W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
No Surrogates				

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.01

Sample Tag: MW-17-86_102723

Collected Date/Time: 10/27/2023 09:55

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 16:22, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.02

Sample Tag: MW-16-82_102723

Collected Date/Time: 10/27/2023 10:50

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 16:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.03

Sample Tag: MW-19-117_102723

Collected Date/Time: 10/27/2023 12:35

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 17:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.04

Sample Tag: MW-19-116_102723

Collected Date/Time: 10/27/2023 13:50

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 17:26, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.05

Sample Tag: MW-19-115_102723

Collected Date/Time: 10/27/2023 15:00

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 17:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.06

Sample Tag: MW-16-74_102723

Collected Date/Time: 10/27/2023 16:00

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 18:08, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.09

Sample Tag: MW-16-81_102723

Collected Date/Time: 10/27/2023 13:40

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 18:29, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.10

Sample Tag: MW-15-72_102723

Collected Date/Time: 10/27/2023 15:05

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 18:50, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.11

Sample Tag: MW-13-43_102823

Collected Date/Time: 10/28/2023 08:45

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 15:16, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.1**	50.0	200.0

Lab Sample ID: S55121.12

Sample Tag: MW-19-120_102823

Collected Date/Time: 10/28/2023 08:55

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 19:32, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.6**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231107A7, Run Date: 11/07/2023 16:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.9**	50.0	200.0
1,4-Difluorobenzene		**102.9**	50.0	200.0
Chlorobenzene-D5		**100.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.0**	50.0	200.0

Lab Sample ID: S55121.13

Sample Tag: MW-13-45_102823

Collected Date/Time: 10/28/2023 10:00

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 19:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55121.14

Sample Tag: MW-16-84_102823

Collected Date/Time: 10/28/2023 10:15

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107A9, Run Date: 11/07/2023 20:14, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.4**	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231107A7, Run Date: 11/07/2023 17:05, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.3**	50.0	200.0
1,4-Difluorobenzene		**94.4**	50.0	200.0
Chlorobenzene-D5		**89.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**86.5**	50.0	200.0

Lab Sample ID: S55121.17

Sample Tag: MW-16-75_102823

Collected Date/Time: 10/28/2023 11:35

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 01:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.6**	50.0	200.0

Lab Sample ID: S55121.18

Sample Tag: MW-16-77_102823

Collected Date/Time: 10/28/2023 13:05

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 01:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**91.3**	50.0	200.0

Lab Sample ID: S55121.19

Sample Tag: MW-16-78_102823

Collected Date/Time: 10/28/2023 14:10

Matrix: Groundwater

COC Reference: 2

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 01:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**72.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231107W2

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A7.BLKW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 14:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.9**	50.0	200.0
1,4-Difluorobenzene		**101.4**	50.0	200.0
Chlorobenzene-D5		**100.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.6**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:11, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.1**	50.0	200.0
1,4-Difluorobenzene		**101.1**	50.0	200.0
Chlorobenzene-D5		**101.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.6**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A7.LCSDW07A, Parent Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:35, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.4**	50.0	200.0
1,4-Difluorobenzene		**101.8**	50.0	200.0
Chlorobenzene-D5		**100.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**99.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A7.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A7, Run Date: 11/07/2023 21:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**97.5**	50.0	200.0
1,4-Difluorobenzene		**99.4**	50.0	200.0
Chlorobenzene-D5		**97.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.2**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A7.5533602M, Parent Sample ID: S55336.01

Run in Batch: 231107A7, Run Date: 11/07/2023 22:33, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.8**	50.0	200.0
1,4-Difluorobenzene		**98.1**	50.0	200.0
Chlorobenzene-D5		**96.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.5**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5512116N, Parent Sample ID: 231107A7.5512115M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:10, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**93.5**	50.0	200.0
1,4-Difluorobenzene		**93.7**	50.0	200.0
Chlorobenzene-D5		**91.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**89.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5533603N, Parent Sample ID: 231107A7.5533602M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:57, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**95.7**	50.0	200.0
1,4-Difluorobenzene		**97.0**	50.0	200.0
Chlorobenzene-D5		**96.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**94.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**114.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**95.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**97.3**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.2**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.7**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**112.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**80.8**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231107W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A7.BLKW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 14:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 231107A7.BLKW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 14:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:11, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		102.4	67.4	121.2
Acetone		77.9	29.9	161.5
Methyl iodide		102.5	68.8	116.4
Carbon disulfide		89.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		111.1	73.2	122.4
Acrylonitrile		104.6	69.9	128.9
2-Butanone (MEK)		100.7	44.0	134.4
Dichlorodifluoromethane		99.3	10.0	222.8
Chloromethane		102.2	23.8	166.5
Vinyl chloride		94.9	43.5	149.1
Bromomethane		92.5	56.8	151.3
Chloroethane		84.0	53.4	149.4
Trichlorofluoromethane		83.6	59.7	151.8
1,1-Dichloroethene		98.6	69.6	139.4
Methylene chloride		102.0	73.3	121.1
trans-1,2-Dichloroethene		98.9	73.6	129.3
1,1-Dichloroethane		104.5	71.5	126.2
cis-1,2-Dichloroethene		101.9	76.6	122.1
Tetrahydrofuran		96.6	59.0	117.9
Chloroform		101.4	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:11, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		104.4	78.2	120.8
1,1,1-Trichloroethane		93.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		102.3	71.6	125.2
2-Hexanone		106.2	55.4	136.9
Carbon tetrachloride		91.7	72.6	133.0
Benzene		100.8	79.9	124.9
1,2-Dichloroethane		101.7	76.0	126.3
Trichloroethene		100.2	79.7	124.2
1,2-Dichloropropane		106.5	78.6	126.4
Bromodichloromethane		107.0	80.4	128.2
Dibromomethane		106.7	76.9	122.1
cis-1,3-Dichloropropene		113.1	79.8	129.9
Toluene		99.6	79.8	124.5
trans-1,3-Dichloropropene		109.0	74.0	131.3
1,1,2-Trichloroethane		104.5	78.7	123.1
Tetrachloroethene		100.2	74.5	124.5
trans-1,4-Dichloro-2-butene		101.3	68.6	135.4
Dibromochloromethane		102.8	74.6	127.2
1,2-Dibromoethane		101.2	70.3	133.7
Chlorobenzene		96.9	79.2	122.7
1,1,1,2-Tetrachloroethane		102.7	80.3	128.2
Ethylbenzene		95.5	79.5	129.1
p,m-Xylene		94.6	79.4	132.2
o-Xylene		95.5	80.2	131.0
Styrene		97.9	69.5	126.7
Isopropylbenzene		94.9	74.4	121.5
Bromoform		102.3	69.4	128.0
1,1,2,2-Tetrachloroethane		99.8	79.8	126.3
1,2,3-Trichloropropane		96.7	78.3	138.8
n-Propylbenzene		95.8	82.0	130.7
Bromobenzene		98.7	78.7	124.6
1,3,5-Trimethylbenzene		96.2	81.3	128.9
tert-Butylbenzene		93.9	80.7	128.9
1,2,4-Trimethylbenzene		95.7	81.4	130.8
sec-Butylbenzene		95.7	77.4	129.8
p-Isopropyltoluene		95.1	79.8	137.5
1,3-Dichlorobenzene		97.1	77.0	131.3
1,4-Dichlorobenzene		98.8	20.7	137.7
1,2-Dichlorobenzene		99.8	10.0	166.2
1,2,3-Trimethylbenzene		97.5	76.3	124.2
n-Butylbenzene		97.5	80.0	133.3
Hexachloroethane		107.6	23.8	138.1
1,2-Dibromo-3-chloropropane		106.4	21.2	189.4
1,2,4-Trichlorobenzene		107.2	27.4	143.4
1,2,3-Trichlorobenzene		109.0	75.4	131.4
Naphthalene		105.5	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:11, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.7	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A7.LCSDW07A, Parent Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:35, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		102.7	67.4	121.2	0.3	30.0
Acetone		71.9	29.9	161.5	8.0	30.0
Methyl iodide		101.0	68.8	116.4	1.4	30.0
Carbon disulfide		85.2	63.8	137.4	4.9	30.0
tert-Methyl butyl ether (MTBE)		114.1	73.2	122.4	2.7	30.0
Acrylonitrile		102.9	69.9	128.9	1.6	30.0
2-Butanone (MEK)		95.8	44.0	134.4	5.0	30.0
Dichlorodifluoromethane		96.7	10.0	222.8	2.7	30.0
Chloromethane		99.5	23.8	166.5	2.7	30.0
Vinyl chloride		90.2	43.5	149.1	5.0	30.0
Bromomethane		90.4	56.8	151.3	2.3	30.0
Chloroethane		86.5	53.4	149.4	3.0	30.0
Trichlorofluoromethane		80.2	59.7	151.8	4.2	30.0
1,1-Dichloroethene		94.9	69.6	139.4	3.8	30.0
Methylene chloride		102.4	73.3	121.1	0.5	30.0
trans-1,2-Dichloroethene		95.9	73.6	129.3	3.0	30.0
1,1-Dichloroethane		102.3	71.5	126.2	2.1	30.0
cis-1,2-Dichloroethene		101.0	76.6	122.1	0.8	30.0
Tetrahydrofuran		93.1	59.0	117.9	3.7	30.0
Chloroform		101.0	78.4	124.0	0.3	30.0
Bromochloromethane		104.2	78.2	120.8	0.2	30.0
1,1,1-Trichloroethane		91.8	79.4	130.9	1.9	30.0
4-Methyl-2-pentanone (MIBK)		99.5	71.6	125.2	2.8	30.0
2-Hexanone		102.1	55.4	136.9	3.9	30.0
Carbon tetrachloride		89.0	72.6	133.0	3.0	30.0
Benzene		98.4	79.9	124.9	2.5	30.0
1,2-Dichloroethane		99.2	76.0	126.3	2.5	30.0
Trichloroethene		96.0	79.7	124.2	4.2	30.0
1,2-Dichloropropane		104.9	78.6	126.4	1.5	30.0
Bromodichloromethane		104.2	80.4	128.2	2.7	30.0
Dibromomethane		102.4	76.9	122.1	4.2	30.0
cis-1,3-Dichloropropene		112.7	79.8	129.9	0.4	30.0
Toluene		96.8	79.8	124.5	2.9	30.0
trans-1,3-Dichloropropene		108.0	74.0	131.3	0.9	30.0
1,1,2-Trichloroethane		102.1	78.7	123.1	2.3	30.0
Tetrachloroethene		96.1	74.5	124.5	4.2	30.0
trans-1,4-Dichloro-2-butene		99.5	68.6	135.4	1.7	30.0
Dibromochloromethane		102.7	74.6	127.2	0.1	30.0
1,2-Dibromoethane		99.1	70.3	133.7	2.0	30.0
Chlorobenzene		95.2	79.2	122.7	1.8	30.0

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 231107A7.LCSDW07A, Parent Sample ID: 231107A7.LCSW07A

Run in Batch: 231107A7, Run Date: 11/07/2023 13:35, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		101.8	80.3	128.2	0.9	30.0
Ethylbenzene		93.3	79.5	129.1	2.4	30.0
p,m-Xylene		91.2	79.4	132.2	3.7	30.0
o-Xylene		94.2	80.2	131.0	1.4	30.0
Styrene		96.4	69.5	126.7	1.5	30.0
Isopropylbenzene		92.4	74.4	121.5	2.6	30.0
Bromoform		100.4	69.4	128.0	1.9	30.0
1,1,2,2-Tetrachloroethane		96.6	79.8	126.3	3.2	30.0
1,2,3-Trichloropropane		93.6	78.3	138.8	3.3	30.0
n-Propylbenzene		93.0	82.0	130.7	3.0	30.0
Bromobenzene		98.5	78.7	124.6	0.2	30.0
1,3,5-Trimethylbenzene		93.6	81.3	128.9	2.8	30.0
tert-Butylbenzene		90.6	80.7	128.9	3.5	30.0
1,2,4-Trimethylbenzene		94.3	81.4	130.8	1.6	30.0
sec-Butylbenzene		93.7	77.4	129.8	2.1	30.0
p-Isopropyltoluene		93.5	79.8	137.5	1.7	30.0
1,3-Dichlorobenzene		96.5	77.0	131.3	0.6	30.0
1,4-Dichlorobenzene		97.6	20.7	137.7	1.2	30.0
1,2-Dichlorobenzene		98.4	10.0	166.2	1.4	30.0
1,2,3-Trimethylbenzene		97.7	76.3	124.2	0.2	30.0
n-Butylbenzene		94.2	80.0	133.3	3.5	30.0
Hexachloroethane		106.0	23.8	138.1	1.5	30.0
1,2-Dibromo-3-chloropropane		105.6	21.2	189.4	0.7	30.0
1,2,4-Trichlorobenzene		106.1	27.4	143.4	1.0	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	2.2	30.0
Naphthalene		104.2	32.9	135.8	1.2	30.0
2-Methylnaphthalene		95.2	25.5	165.5	0.5	30.0

Matrix Spike (MS)

Lab Sample ID: 231107A7.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A7, Run Date: 11/07/2023 21:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		105.6	67.4	121.2
Acetone		88.4	29.9	161.5
Methyl iodide		102.4	68.8	116.4
Carbon disulfide		88.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		108.8	73.2	122.4
Acrylonitrile		107.0	69.9	128.9
2-Butanone (MEK)		101.4	44.0	134.4
Dichlorodifluoromethane		98.7	10.0	222.8
Chloromethane		101.4	23.8	166.5
Vinyl chloride		96.1	43.5	149.1
Bromomethane		90.1	56.8	151.3
Chloroethane		89.1	53.4	149.4
Trichlorofluoromethane		83.2	59.7	151.8
1,1-Dichloroethene		100.3	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 231107A7.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A7, Run Date: 11/07/2023 21:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		102.6	73.3	121.1
trans-1,2-Dichloroethene		99.7	73.6	129.3
1,1-Dichloroethane		105.1	71.5	126.2
cis-1,2-Dichloroethene		103.2	76.6	122.1
Tetrahydrofuran		94.2	59.0	117.9
Chloroform		101.5	78.4	124.0
Bromochloromethane		104.2	78.2	120.8
1,1,1-Trichloroethane		93.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.4	71.6	125.2
2-Hexanone		103.3	55.4	136.9
Carbon tetrachloride		90.9	72.6	133.0
Benzene		100.5	79.9	124.9
1,2-Dichloroethane		100.2	76.0	126.3
Trichloroethene		99.3	79.7	124.2
1,2-Dichloropropane		104.5	78.6	126.4
Bromodichloromethane		102.8	80.4	128.2
Dibromomethane		103.7	76.9	122.1
cis-1,3-Dichloropropene		107.1	79.8	129.9
Toluene		98.5	79.8	124.5
trans-1,3-Dichloropropene		104.5	74.0	131.3
1,1,2-Trichloroethane		103.1	78.7	123.1
Tetrachloroethene		98.3	74.5	124.5
trans-1,4-Dichloro-2-butene		95.2	68.6	135.4
Dibromochloromethane		100.6	74.6	127.2
1,2-Dibromoethane		99.8	70.3	133.7
Chlorobenzene		96.5	79.2	122.7
1,1,1,2-Tetrachloroethane		100.1	80.3	128.2
Ethylbenzene		96.2	79.5	129.1
p,m-Xylene		94.7	79.4	132.2
o-Xylene		95.3	80.2	131.0
Styrene		96.5	69.5	126.7
Isopropylbenzene		94.0	74.4	121.5
Bromoform		99.0	69.4	128.0
1,1,2,2-Tetrachloroethane		96.1	79.8	126.3
1,2,3-Trichloropropane		95.8	78.3	138.8
n-Propylbenzene		93.7	82.0	130.7
Bromobenzene		97.7	78.7	124.6
1,3,5-Trimethylbenzene		94.1	81.3	128.9
tert-Butylbenzene		91.0	80.7	128.9
1,2,4-Trimethylbenzene		93.9	81.4	130.8
sec-Butylbenzene		91.2	77.4	129.8
p-Isopropyltoluene		91.0	79.8	137.5
1,3-Dichlorobenzene		94.6	77.0	131.3
1,4-Dichlorobenzene		95.4	20.7	137.7
1,2-Dichlorobenzene		97.1	10.0	166.2
1,2,3-Trimethylbenzene		94.7	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 231107A7.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A7, Run Date: 11/07/2023 21:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		91.2	80.0	133.3
Hexachloroethane		98.7	23.8	138.1
1,2-Dibromo-3-chloropropane		100.2	21.2	189.4
1,2,4-Trichlorobenzene		99.1	27.4	143.4
1,2,3-Trichlorobenzene		100.9	75.4	131.4
Naphthalene		98.2	32.9	135.8
2-Methylnaphthalene		78.6	25.5	165.5

Matrix Spike (MS)

Lab Sample ID: 231107A7.5533602M, Parent Sample ID: S55336.01

Run in Batch: 231107A7, Run Date: 11/07/2023 22:33, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		101.4	67.4	121.2
Acetone		78.7	29.9	161.5
Methyl iodide		101.2	68.8	116.4
Carbon disulfide		87.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		108.4	73.2	122.4
Acrylonitrile		101.7	69.9	128.9
2-Butanone (MEK)		90.9	44.0	134.4
Dichlorodifluoromethane		98.2	10.0	222.8
Chloromethane		102.2	23.8	166.5
Vinyl chloride		97.0	43.5	149.1
Bromomethane		90.9	56.8	151.3
Chloroethane		86.5	53.4	149.4
Trichlorofluoromethane		82.8	59.7	151.8
1,1-Dichloroethene		91.3	69.6	139.4
Methylene chloride		101.6	73.3	121.1
trans-1,2-Dichloroethene		98.2	73.6	129.3
1,1-Dichloroethane		103.5	71.5	126.2
cis-1,2-Dichloroethene		101.0	76.6	122.1
Tetrahydrofuran		86.7	59.0	117.9
Chloroform		99.8	78.4	124.0
Bromochloromethane		101.8	78.2	120.8
1,1,1-Trichloroethane		93.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		94.0	71.6	125.2
2-Hexanone		95.1	55.4	136.9
Carbon tetrachloride		90.9	72.6	133.0
Benzene		98.7	79.9	124.9
1,2-Dichloroethane		97.2	76.0	126.3
Trichloroethene		97.7	79.7	124.2
1,2-Dichloropropane		104.0	78.6	126.4
Bromodichloromethane		101.5	80.4	128.2
Dibromomethane		101.2	76.9	122.1
cis-1,3-Dichloropropene		107.8	79.8	129.9
Toluene		97.0	79.8	124.5
trans-1,3-Dichloropropene		105.7	74.0	131.3

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 231107A7.5533602M, Parent Sample ID: S55336.01

Run in Batch: 231107A7, Run Date: 11/07/2023 22:33, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,1,2-Trichloroethane		99.4	78.7	123.1
Tetrachloroethene		97.1	74.5	124.5
trans-1,4-Dichloro-2-butene		89.1	68.6	135.4
Dibromochloromethane		99.0	74.6	127.2
1,2-Dibromoethane		97.4	70.3	133.7
Chlorobenzene		95.0	79.2	122.7
1,1,1,2-Tetrachloroethane		100.1	80.3	128.2
Ethylbenzene		93.7	79.5	129.1
p,m-Xylene		92.3	79.4	132.2
o-Xylene		92.5	80.2	131.0
Styrene		95.0	69.5	126.7
Isopropylbenzene		93.0	74.4	121.5
Bromoform		95.1	69.4	128.0
1,1,2,2-Tetrachloroethane		92.5	79.8	126.3
1,2,3-Trichloropropane		87.5	78.3	138.8
n-Propylbenzene		92.1	82.0	130.7
Bromobenzene		96.0	78.7	124.6
1,3,5-Trimethylbenzene		93.3	81.3	128.9
tert-Butylbenzene		90.4	80.7	128.9
1,2,4-Trimethylbenzene		92.7	81.4	130.8
sec-Butylbenzene		91.8	77.4	129.8
p-Isopropyltoluene		91.7	79.8	137.5
1,3-Dichlorobenzene		94.4	77.0	131.3
1,4-Dichlorobenzene		95.6	20.7	137.7
1,2-Dichlorobenzene		95.5	10.0	166.2
1,2,3-Trimethylbenzene		94.2	76.3	124.2
n-Butylbenzene		92.6	80.0	133.3
Hexachloroethane		102.8	23.8	138.1
1,2-Dibromo-3-chloropropane		99.6	21.2	189.4
1,2,4-Trichlorobenzene		101.9	27.4	143.4
1,2,3-Trichlorobenzene		102.9	75.4	131.4
Naphthalene		97.3	32.9	135.8
2-Methylnaphthalene		86.1	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5512116N, Parent Sample ID: 231107A7.5512115M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:10, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		101.0	67.4	121.2	4.4	30.0
Acetone		102.2	29.9	161.5	14.3	30.0
Methyl iodide		97.6	68.8	116.4	4.8	30.0
Carbon disulfide		83.1	63.8	137.4	6.1	30.0
tert-Methyl butyl ether (MTBE)		103.0	73.2	122.4	5.5	30.0
Acrylonitrile		115.9	69.9	128.9	8.0	30.0
2-Butanone (MEK)		111.7	44.0	134.4	9.7	30.0
Dichlorodifluoromethane		98.6	10.0	222.8	0.1	30.0

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 231107A7.5512116N, Parent Sample ID: 231107A7.5512115M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:10, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Chloromethane		97.8	23.8	166.5	3.6	30.0
Vinyl chloride		93.2	43.5	149.1	3.1	30.0
Bromomethane		88.0	56.8	151.3	2.4	30.0
Chloroethane		86.4	53.4	149.4	3.0	30.0
Trichlorofluoromethane		80.5	59.7	151.8	3.3	30.0
1,1-Dichloroethene		90.8	69.6	139.4	9.9	30.0
Methylene chloride		94.9	73.3	121.1	7.7	30.0
trans-1,2-Dichloroethene		93.9	73.6	129.3	6.0	30.0
1,1-Dichloroethane		100.1	71.5	126.2	4.9	30.0
cis-1,2-Dichloroethene		97.3	76.6	122.1	5.9	30.0
Tetrahydrofuran		109.9	59.0	117.9	15.3	30.0
Chloroform		95.5	78.4	124.0	6.1	30.0
Bromochloromethane		96.8	78.2	120.8	7.3	30.0
1,1,1-Trichloroethane		89.8	79.4	130.9	3.6	30.0
4-Methyl-2-pentanone (MIBK)		115.5	71.6	125.2	13.0	30.0
2-Hexanone		118.9	55.4	136.9	14.1	30.0
Carbon tetrachloride		88.9	72.6	133.0	2.3	30.0
Benzene		95.9	79.9	124.9	4.7	30.0
1,2-Dichloroethane		94.3	76.0	126.3	6.1	30.0
Trichloroethene		96.0	79.7	124.2	3.4	30.0
1,2-Dichloropropane		99.4	78.6	126.4	5.0	30.0
Bromodichloromethane		98.4	80.4	128.2	4.4	30.0
Dibromomethane		101.4	76.9	122.1	2.2	30.0
cis-1,3-Dichloropropene		102.9	79.8	129.9	3.9	30.0
Toluene		94.7	79.8	124.5	3.9	30.0
trans-1,3-Dichloropropene		101.8	74.0	131.3	2.6	30.0
1,1,2-Trichloroethane		100.7	78.7	123.1	2.3	30.0
Tetrachloroethene		96.3	74.5	124.5	2.1	30.0
trans-1,4-Dichloro-2-butene		101.9	68.6	135.4	6.8	30.0
Dibromochloromethane		98.2	74.6	127.2	2.4	30.0
1,2-Dibromoethane		101.3	70.3	133.7	1.5	30.0
Chlorobenzene		93.2	79.2	122.7	3.6	30.0
1,1,1,2-Tetrachloroethane		96.6	80.3	128.2	3.6	30.0
Ethylbenzene		93.7	79.5	129.1	2.6	30.0
p,m-Xylene		92.7	79.4	132.2	2.1	30.0
o-Xylene		92.1	80.2	131.0	3.4	30.0
Styrene		92.3	69.5	126.7	4.5	30.0
Isopropylbenzene		92.5	74.4	121.5	1.6	30.0
Bromoform		101.2	69.4	128.0	2.2	30.0
1,1,2,2-Tetrachloroethane		102.2	79.8	126.3	6.1	30.0
1,2,3-Trichloropropane		102.8	78.3	138.8	7.1	30.0
n-Propylbenzene		93.9	82.0	130.7	0.3	30.0
Bromobenzene		93.5	78.7	124.6	4.4	30.0
1,3,5-Trimethylbenzene		92.8	81.3	128.9	1.3	30.0
tert-Butylbenzene		91.1	80.7	128.9	0.0	30.0
1,2,4-Trimethylbenzene		92.3	81.4	130.8	1.7	30.0

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 231107A7.5512116N, Parent Sample ID: 231107A7.5512115M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:10, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
sec-Butylbenzene		94.0	77.4	129.8	3.0	30.0
p-Isopropyltoluene		92.8	79.8	137.5	2.0	30.0
1,3-Dichlorobenzene		93.4	77.0	131.3	1.3	30.0
1,4-Dichlorobenzene		94.5	20.7	137.7	1.0	30.0
1,2-Dichlorobenzene		94.5	10.0	166.2	2.7	30.0
1,2,3-Trimethylbenzene		93.1	76.3	124.2	1.7	30.0
n-Butylbenzene		93.9	80.0	133.3	2.9	30.0
Hexachloroethane		102.4	23.8	138.1	3.7	30.0
1,2-Dibromo-3-chloropropane		121.6	21.2	189.4	19.3	30.0
1,2,4-Trichlorobenzene		101.5	27.4	143.4	2.4	30.0
1,2,3-Trichlorobenzene		106.4	75.4	131.4	5.3	30.0
Naphthalene		113.3	32.9	135.8	14.3	30.0
2-Methylnaphthalene		105.3	25.5	165.5	28.9	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A7.5533603N, Parent Sample ID: 231107A7.5533602M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:57, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		104.5	67.4	121.2	3.0	30.0
Acetone		88.2	29.9	161.5	11.2	30.0
Methyl iodide		100.0	68.8	116.4	1.2	30.0
Carbon disulfide		85.4	63.8	137.4	1.9	30.0
tert-Methyl butyl ether (MTBE)		109.9	73.2	122.4	1.4	30.0
Acrylonitrile		107.4	69.9	128.9	5.4	30.0
2-Butanone (MEK)		101.3	44.0	134.4	10.9	30.0
Dichlorodifluoromethane		97.7	10.0	222.8	0.5	30.0
Chloromethane		99.0	23.8	166.5	3.2	30.0
Vinyl chloride		88.6	43.5	149.1	9.0	30.0
Bromomethane		88.9	56.8	151.3	2.2	30.0
Chloroethane		83.9	53.4	149.4	3.1	30.0
Trichlorofluoromethane		81.4	59.7	151.8	1.7	30.0
1,1-Dichloroethene		96.4	69.6	139.4	5.4	30.0
Methylene chloride		103.0	73.3	121.1	1.3	30.0
trans-1,2-Dichloroethene		96.5	73.6	129.3	1.7	30.0
1,1-Dichloroethane		103.8	71.5	126.2	0.3	30.0
cis-1,2-Dichloroethene		101.3	76.6	122.1	0.3	30.0
Tetrahydrofuran		97.3	59.0	117.9	11.6	30.0
Chloroform		99.8	78.4	124.0	0.0	30.0
Bromochloromethane		103.9	78.2	120.8	2.0	30.0
1,1,1-Trichloroethane		92.1	79.4	130.9	1.5	30.0
4-Methyl-2-pentanone (MIBK)		106.4	71.6	125.2	12.4	30.0
2-Hexanone		106.4	55.4	136.9	11.2	30.0
Carbon tetrachloride		89.4	72.6	133.0	1.6	30.0
Benzene		98.9	79.9	124.9	0.2	30.0
1,2-Dichloroethane		99.9	76.0	126.3	2.7	30.0
Trichloroethene		97.3	79.7	124.2	0.4	30.0

Organics - Volatiles, Prep Batch ID: VF231107W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 231107A7.5533603N, Parent Sample ID: 231107A7.5533602M

Run in Batch: 231107A7, Run Date: 11/07/2023 22:57, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,2-Dichloropropane		104.0	78.6	126.4	0.0	30.0
Bromodichloromethane		103.5	80.4	128.2	1.9	30.0
Dibromomethane		104.9	76.9	122.1	3.7	30.0
cis-1,3-Dichloropropene		109.3	79.8	129.9	1.3	30.0
Toluene		96.9	79.8	124.5	0.1	30.0
trans-1,3-Dichloropropene		107.8	74.0	131.3	2.0	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	3.8	30.0
Tetrachloroethene		96.4	74.5	124.5	0.7	30.0
trans-1,4-Dichloro-2-butene		97.7	68.6	135.4	9.3	30.0
Dibromochloromethane		99.8	74.6	127.2	0.8	30.0
1,2-Dibromoethane		100.9	70.3	133.7	3.6	30.0
Chlorobenzene		94.4	79.2	122.7	0.7	30.0
1,1,1,2-Tetrachloroethane		100.7	80.3	128.2	0.6	30.0
Ethylbenzene		92.7	79.5	129.1	1.1	30.0
p,m-Xylene		91.4	79.4	132.2	0.9	30.0
o-Xylene		92.0	80.2	131.0	0.6	30.0
Styrene		94.1	69.5	126.7	1.0	30.0
Isopropylbenzene		91.3	74.4	121.5	1.9	30.0
Bromoform		100.0	69.4	128.0	5.0	30.0
1,1,2,2-Tetrachloroethane		97.0	79.8	126.3	4.7	30.0
1,2,3-Trichloropropane		94.0	78.3	138.8	7.1	30.0
n-Propylbenzene		91.9	82.0	130.7	0.3	30.0
Bromobenzene		94.8	78.7	124.6	1.2	30.0
1,3,5-Trimethylbenzene		92.0	81.3	128.9	1.4	30.0
tert-Butylbenzene		89.9	80.7	128.9	0.6	30.0
1,2,4-Trimethylbenzene		91.4	81.4	130.8	1.4	30.0
sec-Butylbenzene		93.0	77.4	129.8	1.3	30.0
p-Isopropyltoluene		91.9	79.8	137.5	0.2	30.0
1,3-Dichlorobenzene		94.6	77.0	131.3	0.1	30.0
1,4-Dichlorobenzene		95.8	20.7	137.7	0.2	30.0
1,2-Dichlorobenzene		97.3	10.0	166.2	1.9	30.0
1,2,3-Trimethylbenzene		95.1	76.3	124.2	0.9	30.0
n-Butylbenzene		92.6	80.0	133.3	0.0	30.0
Hexachloroethane		102.6	23.8	138.1	0.2	30.0
1,2-Dibromo-3-chloropropane		111.2	21.2	189.4	11.0	30.0
1,2,4-Trichlorobenzene		103.5	27.4	143.4	1.5	30.0
1,2,3-Trichlorobenzene		106.3	75.4	131.4	3.2	30.0
Naphthalene		105.4	32.9	135.8	8.0	30.0
2-Methylnaphthalene		94.3	25.5	165.5	9.1	30.0

Organics - Volatiles, Prep Batch ID: VS231107W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231107A9.BLKS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 14:58, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.62	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 12:51, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		80.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107A9.LCSDS07A, Parent Sample ID: 231107A9.LCSS07A

Run in Batch: 231107A9, Run Date: 11/07/2023 13:12, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		85.8	70.0	130.0	6.0	30.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5506909M, Parent Sample ID: S55069.08

Run in Batch: 231107A9, Run Date: 11/07/2023 13:34, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.4	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512107M, Parent Sample ID: S55121.06

Run in Batch: 231107A9, Run Date: 11/07/2023 20:56, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.0	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231107A9.5512115M, Parent Sample ID: S55121.14

Run in Batch: 231107A9, Run Date: 11/07/2023 21:38, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.2	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5506910N, Parent Sample ID: 231107A9.5506909M

Run in Batch: 231107A9, Run Date: 11/07/2023 13:55, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		87.3	70.0	130.0	1.0	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512108N, Parent Sample ID: 231107A9.5512107M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:17, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		87.9	70.0	130.0	2.1	30.0

Organics - Volatiles, Prep Batch ID: VS231107W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231107A9.5512116N, Parent Sample ID: 231107A9.5512115M

Run in Batch: 231107A9, Run Date: 11/07/2023 21:59, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		80.7	70.0	130.0	0.9	30.0

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.81	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.8	70.0	130.0	28.7	30.0

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.29	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		74.3	70.0	130.0	17.7	30.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	67.8	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		77.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	58.3	70.0	130.0	3.2	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.1	70.0	130.0	4.2	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55121
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing GWS
Submitted: 10/30/2023 08:15 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[ ] Yes	[X] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000	Special Instructions
55121.01	10/27/23	0955	MW-17-86_102723	GW	3		3						X					
.02	10/27/23	1050	MW-16-82_102723	GW	3		3						X					
.03	10/27/23	1235	MW-19-117_102723	GW	3		3						X					
.04	10/27/23	1350	MW-19-116_102723	GW	3		3						X					
.05	10/27/23	1500	MW-19-115_102723	GW	3		3						X					
.06/.07/.08	10/27/23	1600	MW-16-74_102723	GW	9		9						X					MS/MSD
.09	10/27/23	1340	MW-16-81_102723	GW	3		3						X					
.10	10/27/23	1505	MW-15-72_102723	GW	3		3						X					
.11	10/28/23	845	MW-13-43_102823	GW	3		3						X					
.12	10/28/23	855	MW-19-20_102823	GW	3		3						X					
.13	10/28/23	10:00	MW-13-45_102823	GW	3		3						X					
.14/.15/.16	10/28/23	10:15	MW-16-84_102823	GW	9		9						X					MS/MSD

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Brady J. Cogan

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55121.17	10/28/23	1135	MW-16-75_102823	GW	3		3						X				
.18	10/28/23	1305	MW-16-77_102823	GW	3		3						X				
.19	10/28/23	1410	MW-16-78_102823	GW	3		3						X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55122.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55122.01-S55122.07
Project: 30171056.0470A / RACER Lansing GWS
Collected Date(s): 10/27/2023 - 10/28/2023
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Billy Cobern
P.O. #: US3460011441

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55122.01	MW-14-63_102723	Groundwater	10/27/23 09:25
S55122.02	MW-14-56_102723	Groundwater	10/27/23 10:45
S55122.03	MW-20-130_102723	Groundwater	10/27/23 12:25
S55122.04	MW-21-140_102823	Groundwater	10/28/23 11:20
S55122.05	MW-16-85_102823	Groundwater	10/28/23 12:15
S55122.06	MW-16-80_102823	Groundwater	10/28/23 13:45
S55122.07	DUP-04_102723	Groundwater	10/28/23 00:01

Lab Sample ID: S55122.01
Sample Tag: MW-14-63_102723
Collected Date/Time: 10/27/2023 09:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.02
Sample Tag: MW-14-56_102723
Collected Date/Time: 10/27/2023 10:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:31, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	17	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.03
Sample Tag: MW-20-130_102723
Collected Date/Time: 10/27/2023 12:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:52, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.04
Sample Tag: MW-21-140_102823
Collected Date/Time: 10/28/2023 11:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.05
Sample Tag: MW-16-85_102823
Collected Date/Time: 10/28/2023 12:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 03:33, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.06
Sample Tag: MW-16-80_102823
Collected Date/Time: 10/28/2023 13:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 03:55, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	22	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.07
Sample Tag: DUP-04_102723
Collected Date/Time: 10/28/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:16, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	14	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55122.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55122.01-S55122.07
Project: 30171056.0470A / RACER Lansing GWS
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Billy Cobern
P.O. #: US3460011441

QC Report Sections

Cover Page (Page 13)
Analysis Summary (Pages 14-20)
Prep Batch Summary (Page 21)
Surrogates per QC Sample (Pages 22-23)
Internal Standards per Lab Sample (Pages 24-30)
Internal Standards per QC Sample (Pages 31-32)
Batch QC Results (Pages 33-34)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55122.01
Sample Tag: MW-14-63_102723
Collected Date/Time: 10/27/2023 09:25
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 02:10	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55122.02
Sample Tag: MW-14-56_102723
Collected Date/Time: 10/27/2023 10:45
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 02:31	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55122.03
Sample Tag: MW-20-130_102723
Collected Date/Time: 10/27/2023 12:25
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 02:52	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55122.04
Sample Tag: MW-21-140_102823
Collected Date/Time: 10/28/2023 11:20
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 15:37	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55122.05
Sample Tag: MW-16-85_102823
Collected Date/Time: 10/28/2023 12:15
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 03:33	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55122.06
Sample Tag: MW-16-80_102823
Collected Date/Time: 10/28/2023 13:45
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 03:55	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55122.07
Sample Tag: DUP-04_102723
Collected Date/Time: 10/28/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 04:16	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55122.01	1,4-Dioxane	SW8260B - SIM	11/08/23 02:10	231107B9
S55122.02	1,4-Dioxane	SW8260B - SIM	11/08/23 02:31	231107B9
S55122.03	1,4-Dioxane	SW8260B - SIM	11/08/23 02:52	231107B9
S55122.05	1,4-Dioxane	SW8260B - SIM	11/08/23 03:33	231107B9
S55122.06	1,4-Dioxane	SW8260B - SIM	11/08/23 03:55	231107B9
S55122.07	1,4-Dioxane	SW8260B - SIM	11/08/23 04:16	231107B9

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55122.04	1,4-Dioxane	SW8260B - SIM	11/09/23 15:37	231109A9

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.01

Sample Tag: MW-14-63_102723

Collected Date/Time: 10/27/2023 09:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 02:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.02

Sample Tag: MW-14-56_102723

Collected Date/Time: 10/27/2023 10:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 02:31, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**85.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.03

Sample Tag: MW-20-130_102723

Collected Date/Time: 10/27/2023 12:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 02:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**88.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.04

Sample Tag: MW-21-140_102823

Collected Date/Time: 10/28/2023 11:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 15:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.05

Sample Tag: MW-16-85_102823

Collected Date/Time: 10/28/2023 12:15

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 03:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**86.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55122.06

Sample Tag: MW-16-80_102823

Collected Date/Time: 10/28/2023 13:45

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 03:55, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.9**	50.0	200.0

Lab Sample ID: S55122.07

Sample Tag: DUP-04_102723

Collected Date/Time: 10/28/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 04:16, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.8**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**112.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**80.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.81	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.8	70.0	130.0	28.7	30.0

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.29	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		74.3	70.0	130.0	17.7	30.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	67.8	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		77.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	58.3	70.0	130.0	3.2	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.1	70.0	130.0	4.2	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55122
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing GWS
Submitted: 10/30/2023 08:15 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[ ] Yes	[X] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. LeBeau

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55122.01	10/27/23	925	MW-14-63_102723	GW	3		3						X	
.02	10/27/23	1045	MW-14-56_102723	GW	3		3						X	
.03	10/27/23	1225	MW-20-130_102723	GW	3		3						X	
.04	10/28/23	1120	MW-21-140_102823	GW	3		3						X	
.05	10/28/23	1215	MW-16-85_102823	GW	3		3						X	
.06	10/28/23	1345	MW-16-80_102823	GW	3		3						X	
.07	10/27/23	—	DUP-04_102723	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Gilcrease	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55123.01(01)+QC01
Generated on 11/06/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
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Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55123.01-S55123.04
Project: 30171056.00102/ RACER Lansing GWS
Collected Date(s): 10/27/2023
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Austin Westhuis
P.O. #: PO

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55123.01	MW-22-152_102723	Groundwater	10/27/23 10:35
S55123.02	MW-22-154_102723	Groundwater	10/27/23 11:25
S55123.03	DUP-16_102723	Groundwater	10/27/23 00:01
S55123.04	Trip Blank	Water	10/27/23 00:01

Lab Sample ID: S55123.01
Sample Tag: MW-22-152_102723
Collected Date/Time: 10/27/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:24, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.01 (continued)
Sample Tag: MW-22-152_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:24, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.02
Sample Tag: MW-22-154_102723
Collected Date/Time: 10/27/2023 11:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:47, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.02 (continued)
Sample Tag: MW-22-154_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:47, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.03
Sample Tag: DUP-16_102723
Collected Date/Time: 10/27/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 21:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.03 (continued)
Sample Tag: DUP-16_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 21:10, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.04
Sample Tag: Trip Blank
Collected Date/Time: 10/27/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 16:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.04 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 16:04, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S55123.01(01)+QC01
Generated on 11/06/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55123.01-S55123.04
Project: 30171056.00102/ RACER Lansing GWS
Submitted Date/Time: 10/30/2023 08:15
Sampled by: Austin Westhuis
P.O. #: PO

QC Report Sections

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Analysis Summary (Pages 15-18)
Prep Batch Summary (Page 19)
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Surrogates per QC Sample (Page 24)
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Internal Standards per QC Sample (Page 29)
Batch QC Results (Pages 30-34)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55123.01
Sample Tag: MW-22-152_102723
Collected Date/Time: 10/27/2023 10:35
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 20:24	231103A7	VF231103W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S55123.02
Sample Tag: MW-22-154_102723
Collected Date/Time: 10/27/2023 11:25
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 20:47	231103A7	VF231103W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S55123.03
Sample Tag: DUP-16_102723
Collected Date/Time: 10/27/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 21:10	231103A7	VF231103W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S55123.04

Sample Tag: Trip Blank

Collected Date/Time: 10/27/2023 00:01

Matrix: Water

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 16:04	231103A7	VF231103W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF231103W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55123.01	Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 20:24	231103A7
S55123.02	Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 20:47	231103A7
S55123.03	Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 21:10	231103A7
S55123.04	Volatile Organics - DEQ List	SW5030C/8260C	11/03/23 16:04	231103A7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55123.01

Sample Tag: MW-22-152_102723

Collected Date/Time: 10/27/2023 10:35

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 20:24, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.1**	80.0	124.0
1,2-Dichloroethane-D4		**95.1**	72.0	125.0
Toluene-D8		**93.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55123.02

Sample Tag: MW-22-154_102723

Collected Date/Time: 10/27/2023 11:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 20:47, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.6**	80.0	124.0
1,2-Dichloroethane-D4		**93.3**	72.0	125.0
Toluene-D8		**94.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55123.03

Sample Tag: DUP-16_102723

Collected Date/Time: 10/27/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 21:10, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.1**	80.0	124.0
1,2-Dichloroethane-D4		**94.7**	72.0	125.0
Toluene-D8		**93.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55123.04

Sample Tag: Trip Blank

Collected Date/Time: 10/27/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 16:04, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**100.5**	80.0	124.0
1,2-Dichloroethane-D4		**97.4**	72.0	125.0
Toluene-D8		**93.7**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF231103W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231103A7.BLKW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 14:30, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**98.0**	80.0	124.0
1,2-Dichloroethane-D4		**92.1**	72.0	125.0
Toluene-D8		**93.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 12:56, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.5**	80.0	124.0
1,2-Dichloroethane-D4		**88.7**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231103A7.LCSDW03A, Parent Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**89.7**	72.0	125.0
Toluene-D8		**94.3**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55123.01

Sample Tag: MW-22-152_102723

Collected Date/Time: 10/27/2023 10:35

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 20:24, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**96.9**	50.0	200.0
1,4-Difluorobenzene		**100.2**	50.0	200.0
Chlorobenzene-D5		**99.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**94.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55123.02

Sample Tag: MW-22-154_102723

Collected Date/Time: 10/27/2023 11:25

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 20:47, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**95.1**	50.0	200.0
1,4-Difluorobenzene		**98.1**	50.0	200.0
Chlorobenzene-D5		**95.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**92.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55123.03

Sample Tag: DUP-16_102723

Collected Date/Time: 10/27/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 21:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**93.6**	50.0	200.0
1,4-Difluorobenzene		**96.8**	50.0	200.0
Chlorobenzene-D5		**95.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**90.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55123.04

Sample Tag: Trip Blank

Collected Date/Time: 10/27/2023 00:01

Matrix: Water

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231103A7, Run Date: 11/03/2023 16:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**101.5**	50.0	200.0
1,4-Difluorobenzene		**106.1**	50.0	200.0
Chlorobenzene-D5		**105.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**101.6**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231103W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231103A7.BLKW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 14:30, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**96.8**	50.0	200.0
1,4-Difluorobenzene		**98.6**	50.0	200.0
Chlorobenzene-D5		**96.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**93.3**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 12:56, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.0**	50.0	200.0
1,4-Difluorobenzene		**100.0**	50.0	200.0
Chlorobenzene-D5		**100.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.0**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231103A7.LCSDW03A, Parent Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.4**	50.0	200.0
1,4-Difluorobenzene		**102.2**	50.0	200.0
Chlorobenzene-D5		**101.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231103W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231103A7.BLKW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 14:30, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF231103W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 231103A7.BLKW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 14:30, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 12:56, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		92.7	67.4	121.2
Acetone		92.7	29.9	161.5
Methyl iodide		99.8	68.8	116.4
Carbon disulfide		86.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		96.2	73.2	122.4
Acrylonitrile		104.7	69.9	128.9
2-Butanone (MEK)		99.4	44.0	134.4
Dichlorodifluoromethane		98.1	10.0	222.8
Chloromethane		94.6	23.8	166.5
Vinyl chloride		87.1	43.5	149.1
Bromomethane		88.1	56.8	151.3
Chloroethane		84.3	53.4	149.4
Trichlorofluoromethane		84.6	59.7	151.8
1,1-Dichloroethene		93.4	69.6	139.4
Methylene chloride		94.1	73.3	121.1
trans-1,2-Dichloroethene		91.8	73.6	129.3
1,1-Dichloroethane		97.5	71.5	126.2
cis-1,2-Dichloroethene		95.9	76.6	122.1
Tetrahydrofuran		96.4	59.0	117.9
Chloroform		95.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF231103W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 12:56, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		97.4	78.2	120.8
1,1,1-Trichloroethane		91.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		104.4	71.6	125.2
2-Hexanone		106.8	55.4	136.9
Carbon tetrachloride		97.5	72.6	133.0
Benzene		99.3	79.9	124.9
1,2-Dichloroethane		98.0	76.0	126.3
Trichloroethene		99.7	79.7	124.2
1,2-Dichloropropane		101.1	78.6	126.4
Bromodichloromethane		102.2	80.4	128.2
Dibromomethane		106.0	76.9	122.1
cis-1,3-Dichloropropene		104.8	79.8	129.9
Toluene		98.4	79.8	124.5
trans-1,3-Dichloropropene		101.4	74.0	131.3
1,1,2-Trichloroethane		102.3	78.7	123.1
Tetrachloroethene		102.3	74.5	124.5
trans-1,4-Dichloro-2-butene		112.7	68.6	135.4
Dibromochloromethane		108.2	74.6	127.2
1,2-Dibromoethane		106.4	70.3	133.7
Chlorobenzene		101.4	79.2	122.7
1,1,1,2-Tetrachloroethane		106.3	80.3	128.2
Ethylbenzene		102.2	79.5	129.1
p,m-Xylene		102.1	79.4	132.2
o-Xylene		100.5	80.2	131.0
Styrene		103.5	69.5	126.7
Isopropylbenzene		101.4	74.4	121.5
Bromoform		113.5	69.4	128.0
1,1,2,2-Tetrachloroethane		107.1	79.8	126.3
1,2,3-Trichloropropane		106.0	78.3	138.8
n-Propylbenzene		102.3	82.0	130.7
Bromobenzene		104.7	78.7	124.6
1,3,5-Trimethylbenzene		105.1	81.3	128.9
tert-Butylbenzene		101.0	80.7	128.9
1,2,4-Trimethylbenzene		103.5	81.4	130.8
sec-Butylbenzene		99.2	77.4	129.8
p-Isopropyltoluene		98.9	79.8	137.5
1,3-Dichlorobenzene		99.7	77.0	131.3
1,4-Dichlorobenzene		100.7	20.7	137.7
1,2-Dichlorobenzene		101.8	10.0	166.2
1,2,3-Trimethylbenzene		99.4	76.3	124.2
n-Butylbenzene		98.1	80.0	133.3
Hexachloroethane		114.7	23.8	138.1
1,2-Dibromo-3-chloropropane		118.0	21.2	189.4
1,2,4-Trichlorobenzene		104.4	27.4	143.4
1,2,3-Trichlorobenzene		110.1	75.4	131.4
Naphthalene		110.5	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF231103W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 12:56, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.3	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231103A7.LCSDW03A, Parent Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		89.8	67.4	121.2	3.2	30.0
Acetone		85.3	29.9	161.5	8.3	30.0
Methyl iodide		95.8	68.8	116.4	4.1	30.0
Carbon disulfide		84.8	63.8	137.4	1.9	30.0
tert-Methyl butyl ether (MTBE)		91.6	73.2	122.4	4.9	30.0
Acrylonitrile		103.2	69.9	128.9	1.4	30.0
2-Butanone (MEK)		95.4	44.0	134.4	4.1	30.0
Dichlorodifluoromethane		93.6	10.0	222.8	4.7	30.0
Chloromethane		89.9	23.8	166.5	5.1	30.0
Vinyl chloride		86.8	43.5	149.1	0.3	30.0
Bromomethane		83.3	56.8	151.3	5.6	30.0
Chloroethane		80.2	53.4	149.4	5.0	30.0
Trichlorofluoromethane		79.1	59.7	151.8	6.8	30.0
1,1-Dichloroethene		90.0	69.6	139.4	3.6	30.0
Methylene chloride		90.9	73.3	121.1	3.5	30.0
trans-1,2-Dichloroethene		89.4	73.6	129.3	2.6	30.0
1,1-Dichloroethane		93.4	71.5	126.2	4.3	30.0
cis-1,2-Dichloroethene		91.7	76.6	122.1	4.4	30.0
Tetrahydrofuran		94.6	59.0	117.9	1.9	30.0
Chloroform		91.9	78.4	124.0	4.1	30.0
Bromochloromethane		93.8	78.2	120.8	3.8	30.0
1,1,1-Trichloroethane		88.7	79.4	130.9	3.0	30.0
4-Methyl-2-pentanone (MIBK)		101.2	71.6	125.2	3.1	30.0
2-Hexanone		103.4	55.4	136.9	3.3	30.0
Carbon tetrachloride		91.5	72.6	133.0	6.4	30.0
Benzene		94.4	79.9	124.9	5.1	30.0
1,2-Dichloroethane		94.4	76.0	126.3	3.7	30.0
Trichloroethene		95.6	79.7	124.2	4.2	30.0
1,2-Dichloropropane		97.1	78.6	126.4	4.0	30.0
Bromodichloromethane		97.4	80.4	128.2	4.9	30.0
Dibromomethane		103.6	76.9	122.1	2.3	30.0
cis-1,3-Dichloropropene		100.2	79.8	129.9	4.5	30.0
Toluene		95.2	79.8	124.5	3.3	30.0
trans-1,3-Dichloropropene		99.0	74.0	131.3	2.4	30.0
1,1,2-Trichloroethane		98.2	78.7	123.1	4.0	30.0
Tetrachloroethene		97.6	74.5	124.5	4.7	30.0
trans-1,4-Dichloro-2-butene		109.8	68.6	135.4	2.6	30.0
Dibromochloromethane		104.2	74.6	127.2	3.7	30.0
1,2-Dibromoethane		103.5	70.3	133.7	2.7	30.0
Chlorobenzene		97.2	79.2	122.7	4.3	30.0

Organics - Volatiles, Prep Batch ID: VF231103W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 231103A7.LCSDW03A, Parent Sample ID: 231103A7.LCSW03A

Run in Batch: 231103A7, Run Date: 11/03/2023 13:19, Prep Date: 11/03/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		104.4	80.3	128.2	1.8	30.0
Ethylbenzene		97.5	79.5	129.1	4.6	30.0
p,m-Xylene		98.3	79.4	132.2	3.8	30.0
o-Xylene		96.5	80.2	131.0	4.0	30.0
Styrene		98.8	69.5	126.7	4.6	30.0
Isopropylbenzene		98.6	74.4	121.5	2.8	30.0
Bromoform		108.3	69.4	128.0	4.7	30.0
1,1,2,2-Tetrachloroethane		103.1	79.8	126.3	3.8	30.0
1,2,3-Trichloropropane		103.1	78.3	138.8	2.8	30.0
n-Propylbenzene		98.4	82.0	130.7	3.8	30.0
Bromobenzene		100.7	78.7	124.6	4.0	30.0
1,3,5-Trimethylbenzene		99.8	81.3	128.9	5.2	30.0
tert-Butylbenzene		97.7	80.7	128.9	3.4	30.0
1,2,4-Trimethylbenzene		100.0	81.4	130.8	3.4	30.0
sec-Butylbenzene		96.8	77.4	129.8	2.4	30.0
p-Isopropyltoluene		97.5	79.8	137.5	1.4	30.0
1,3-Dichlorobenzene		97.0	77.0	131.3	2.8	30.0
1,4-Dichlorobenzene		98.8	20.7	137.7	2.0	30.0
1,2-Dichlorobenzene		98.5	10.0	166.2	3.3	30.0
1,2,3-Trimethylbenzene		96.8	76.3	124.2	2.6	30.0
n-Butylbenzene		96.6	80.0	133.3	1.6	30.0
Hexachloroethane		110.2	23.8	138.1	4.0	30.0
1,2-Dibromo-3-chloropropane		115.8	21.2	189.4	1.9	30.0
1,2,4-Trichlorobenzene		103.6	27.4	143.4	0.8	30.0
1,2,3-Trichlorobenzene		107.7	75.4	131.4	2.2	30.0
Naphthalene		107.1	32.9	135.8	3.1	30.0
2-Methylnaphthalene		95.6	25.5	165.5	0.3	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55123
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.00102/ RACER Lansing GWS
Submitted: 10/30/2023 08:15 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 6

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus LeWu

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55123.01	10/27/23	1035	MW-22-152_102723	GW	3		3							X
.02	10/27/23	1125	MW-22-154_102723	GW	3		3							X
.03	10/27/23	—	DUP-16_102723	GW	3		3							X
.04	10/27/23	—	Trip Blank	GW	1		1							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Aus LeWu / Arcadis ☒ Sampler		
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	M Quilcotto	DATE 10/30/23	TIME 0815
		DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55263.01(01)+QC01
Generated on 11/09/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55263.01-S55263.08
Project: 30171056.0470A / RACER Lansing GWS
Collected Date(s): 10/30/2023 - 10/31/2023
Submitted Date/Time: 11/02/2023 08:00
Sampled by: Donald Richmond
P.O. #: US3460011441

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55263.01	MW-21-141_103023	Groundwater	10/30/23 10:30
S55263.02	MW-02-02(6)_103023	Groundwater	10/30/23 12:05
S55263.03	MW-03-05_103023	Groundwater	10/30/23 13:40
S55263.04	MW-03-06_103023	Groundwater	10/30/23 15:10
S55263.05	MW-04-05(6)_103123	Groundwater	10/31/23 12:30
S55263.06	Trip Blank	Groundwater	10/30/23 00:01
S55263.07	DUP-11_103023	Groundwater	10/30/23 00:01
S55263.08	DUP-13_103023	Groundwater	10/30/23 00:01

Lab Sample ID: S55263.01
Sample Tag: MW-21-141_103023
Collected Date/Time: 10/30/2023 10:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:37, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.02
Sample Tag: MW-02-02(6)_103023
Collected Date/Time: 10/30/2023 12:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:58, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	23	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.03
Sample Tag: MW-03-05_103023
Collected Date/Time: 10/30/2023 13:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 05:19, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.04
Sample Tag: MW-03-06_103023
Collected Date/Time: 10/30/2023 15:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 05:40, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.05
Sample Tag: MW-04-05(6)_103123
Collected Date/Time: 10/31/2023 12:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/09/23 11:34	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 05:11, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55263.05 (continued)
Sample Tag: MW-04-05(6)_103123

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 05:11, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55263.06
Sample Tag: Trip Blank
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/09/23 11:34	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 02:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55263.06 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 02:49, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S55263.07
Sample Tag: DUP-11_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:01, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.08
Sample Tag: DUP-13_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:21, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55263.01(01)+QC01
Generated on 11/09/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55263.01-S55263.08
Project: 30171056.0470A / RACER Lansing GWS
Submitted Date/Time: 11/02/2023 08:00
Sampled by: Donald Richmond
P.O. #: US3460011441

QC Report Sections

Cover Page (Page 16)
Analysis Summary (Pages 17-24)
Prep Batch Summary (Page 25)
Surrogates per Lab Sample (Pages 26-27)
Surrogates per QC Sample (Pages 28-29)
Internal Standards per Lab Sample (Pages 30-37)
Internal Standards per QC Sample (Pages 38-39)
Batch QC Results (Pages 40-45)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55263.01
Sample Tag: MW-21-141_103023
Collected Date/Time: 10/30/2023 10:30
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 04:37	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.02
Sample Tag: MW-02-02(6)_103023
Collected Date/Time: 10/30/2023 12:05
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 04:58	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S55263.03
Sample Tag: MW-03-05_103023
Collected Date/Time: 10/30/2023 13:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 05:19	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.04
Sample Tag: MW-03-06_103023
Collected Date/Time: 10/30/2023 15:10
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 05:40	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.05

Sample Tag: MW-04-05(6)_103123

Collected Date/Time: 10/31/2023 12:30

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/09/23 05:11	231108B7	VF231108W4	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.06

Sample Tag: Trip Blank

Collected Date/Time: 10/30/2023 00:01

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/09/23 02:49	231108B7	VF231108W4	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.07
Sample Tag: DUP-11_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 06:01	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55263.08
Sample Tag: DUP-13_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 06:21	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF231108W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55263.05	Volatile Organics - DEQ List	SW5030C/8260C	11/09/23 05:11	231108B7
S55263.06	Volatile Organics - DEQ List	SW5030C/8260C	11/09/23 02:49	231108B7

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55263.01	1,4-Dioxane	SW8260B - SIM	11/08/23 04:37	231107B9
S55263.02	1,4-Dioxane	SW8260B - SIM	11/08/23 04:58	231107B9
S55263.03	1,4-Dioxane	SW8260B - SIM	11/08/23 05:19	231107B9
S55263.04	1,4-Dioxane	SW8260B - SIM	11/08/23 05:40	231107B9
S55263.07	1,4-Dioxane	SW8260B - SIM	11/08/23 06:01	231107B9
S55263.08	1,4-Dioxane	SW8260B - SIM	11/08/23 06:21	231107B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55263.05

Sample Tag: MW-04-05(6)_103123

Collected Date/Time: 10/31/2023 12:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231108B7, Run Date: 11/09/2023 05:11, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.7**	80.0	124.0
1,2-Dichloroethane-D4		**105.7**	72.0	125.0
Toluene-D8		**95.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S55263.06

Sample Tag: Trip Blank

Collected Date/Time: 10/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231108B7, Run Date: 11/09/2023 02:49, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.4**	80.0	124.0
1,2-Dichloroethane-D4		**99.5**	72.0	125.0
Toluene-D8		**95.5**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF231108W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231108B7.BLKW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 02:02, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**99.7**	72.0	125.0
Toluene-D8		**94.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:27, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.8**	80.0	124.0
1,2-Dichloroethane-D4		**98.2**	72.0	125.0
Toluene-D8		**95.7**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231108B7.LCSDW08B, Parent Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:50, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**95.7**	80.0	124.0
1,2-Dichloroethane-D4		**93.9**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.01

Sample Tag: MW-21-141_103023

Collected Date/Time: 10/30/2023 10:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 04:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.02

Sample Tag: MW-02-02(6)_103023

Collected Date/Time: 10/30/2023 12:05

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 04:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**91.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.03

Sample Tag: MW-03-05_103023

Collected Date/Time: 10/30/2023 13:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 05:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.04

Sample Tag: MW-03-06_103023

Collected Date/Time: 10/30/2023 15:10

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 05:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.05

Sample Tag: MW-04-05(6)_103123

Collected Date/Time: 10/31/2023 12:30

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231108B7, Run Date: 11/09/2023 05:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**103.7**	50.0	200.0
1,4-Difluorobenzene		**108.5**	50.0	200.0
Chlorobenzene-D5		**110.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**111.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.06

Sample Tag: Trip Blank

Collected Date/Time: 10/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 231108B7, Run Date: 11/09/2023 02:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**109.4**	50.0	200.0
1,4-Difluorobenzene		**111.7**	50.0	200.0
Chlorobenzene-D5		**112.7**	50.0	200.0
1,4-Dichlorobenzene-D4		**112.7**	50.0	200.0

Lab Sample ID: S55263.07

Sample Tag: DUP-11_103023

Collected Date/Time: 10/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 06:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55263.08

Sample Tag: DUP-13_103023

Collected Date/Time: 10/30/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 06:21, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231108W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231108B7.BLKW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 02:02, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**110.3**	50.0	200.0
1,4-Difluorobenzene		**113.7**	50.0	200.0
Chlorobenzene-D5		**115.2**	50.0	200.0
1,4-Dichlorobenzene-D4		**114.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:27, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**107.4**	50.0	200.0
1,4-Difluorobenzene		**109.4**	50.0	200.0
Chlorobenzene-D5		**110.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**111.8**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231108B7.LCSDW08B, Parent Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:50, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.1**	50.0	200.0
1,4-Difluorobenzene		**101.6**	50.0	200.0
Chlorobenzene-D5		**101.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**99.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**112.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**80.8**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF231108W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231108B7.BLKW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 02:02, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF231108W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 231108B7.BLKW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 02:02, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:27, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		106.9	67.4	121.2
Acetone		91.3	29.9	161.5
Methyl iodide		107.4	68.8	116.4
Carbon disulfide		92.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		114.7	73.2	122.4
Acrylonitrile		106.8	69.9	128.9
2-Butanone (MEK)		98.8	44.0	134.4
Dichlorodifluoromethane		99.4	10.0	222.8
Chloromethane		106.0	23.8	166.5
Vinyl chloride		97.3	43.5	149.1
Bromomethane		92.6	56.8	151.3
Chloroethane		91.5	53.4	149.4
Trichlorofluoromethane		86.8	59.7	151.8
1,1-Dichloroethene		104.9	69.6	139.4
Methylene chloride		110.2	73.3	121.1
trans-1,2-Dichloroethene		104.7	73.6	129.3
1,1-Dichloroethane		109.9	71.5	126.2
cis-1,2-Dichloroethene		106.9	76.6	122.1
Tetrahydrofuran		95.2	59.0	117.9
Chloroform		106.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF231108W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:27, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		109.0	78.2	120.8
1,1,1-Trichloroethane		98.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		105.4	71.6	125.2
2-Hexanone		105.4	55.4	136.9
Carbon tetrachloride		97.1	72.6	133.0
Benzene		104.5	79.9	124.9
1,2-Dichloroethane		104.8	76.0	126.3
Trichloroethene		103.6	79.7	124.2
1,2-Dichloropropane		110.3	78.6	126.4
Bromodichloromethane		110.1	80.4	128.2
Dibromomethane		110.0	76.9	122.1
cis-1,3-Dichloropropene		115.3	79.8	129.9
Toluene		103.6	79.8	124.5
trans-1,3-Dichloropropene		110.6	74.0	131.3
1,1,2-Trichloroethane		108.9	78.7	123.1
Tetrachloroethene		102.0	74.5	124.5
trans-1,4-Dichloro-2-butene		91.9	68.6	135.4
Dibromochloromethane		105.9	74.6	127.2
1,2-Dibromoethane		104.8	70.3	133.7
Chlorobenzene		100.4	79.2	122.7
1,1,1,2-Tetrachloroethane		106.1	80.3	128.2
Ethylbenzene		98.7	79.5	129.1
p,m-Xylene		97.0	79.4	132.2
o-Xylene		97.5	80.2	131.0
Styrene		100.8	69.5	126.7
Isopropylbenzene		97.5	74.4	121.5
Bromoform		100.6	69.4	128.0
1,1,2,2-Tetrachloroethane		100.2	79.8	126.3
1,2,3-Trichloropropane		99.2	78.3	138.8
n-Propylbenzene		97.6	82.0	130.7
Bromobenzene		101.0	78.7	124.6
1,3,5-Trimethylbenzene		98.2	81.3	128.9
tert-Butylbenzene		95.7	80.7	128.9
1,2,4-Trimethylbenzene		97.5	81.4	130.8
sec-Butylbenzene		96.8	77.4	129.8
p-Isopropyltoluene		95.2	79.8	137.5
1,3-Dichlorobenzene		99.2	77.0	131.3
1,4-Dichlorobenzene		100.9	20.7	137.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2,3-Trimethylbenzene		100.1	76.3	124.2
n-Butylbenzene		96.2	80.0	133.3
Hexachloroethane		107.3	23.8	138.1
1,2-Dibromo-3-chloropropane		107.9	21.2	189.4
1,2,4-Trichlorobenzene		107.7	27.4	143.4
1,2,3-Trichlorobenzene		109.2	75.4	131.4
Naphthalene		105.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF231108W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:27, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		94.7	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231108B7.LCSDW08B, Parent Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:50, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.8	67.4	121.2	0.9	30.0
Acetone		101.2	29.9	161.5	10.4	30.0
Methyl iodide		104.6	68.8	116.4	2.7	30.0
Carbon disulfide		89.1	63.8	137.4	4.2	30.0
tert-Methyl butyl ether (MTBE)		115.5	73.2	122.4	0.7	30.0
Acrylonitrile		120.7	69.9	128.9	12.3	30.0
2-Butanone (MEK)		112.3	44.0	134.4	12.8	30.0
Dichlorodifluoromethane		97.9	10.0	222.8	1.5	30.0
Chloromethane		103.7	23.8	166.5	2.2	30.0
Vinyl chloride		99.0	43.5	149.1	1.8	30.0
Bromomethane		93.5	56.8	151.3	0.9	30.0
Chloroethane		90.1	53.4	149.4	1.6	30.0
Trichlorofluoromethane		85.6	59.7	151.8	1.5	30.0
1,1-Dichloroethene		101.6	69.6	139.4	3.2	30.0
Methylene chloride		104.7	73.3	121.1	5.1	30.0
trans-1,2-Dichloroethene		100.4	73.6	129.3	4.2	30.0
1,1-Dichloroethane		108.1	71.5	126.2	1.6	30.0
cis-1,2-Dichloroethene		104.7	76.6	122.1	2.1	30.0
Tetrahydrofuran	*	119.6	59.0	117.9	22.7	30.0
Chloroform		103.9	78.4	124.0	2.8	30.0
Bromochloromethane		106.0	78.2	120.8	2.8	30.0
1,1,1-Trichloroethane		96.4	79.4	130.9	2.6	30.0
4-Methyl-2-pentanone (MIBK)		121.1	71.6	125.2	13.8	30.0
2-Hexanone		122.5	55.4	136.9	15.0	30.0
Carbon tetrachloride		95.2	72.6	133.0	1.9	30.0
Benzene		103.6	79.9	124.9	0.8	30.0
1,2-Dichloroethane		102.9	76.0	126.3	1.9	30.0
Trichloroethene		103.9	79.7	124.2	0.2	30.0
1,2-Dichloropropane		107.6	78.6	126.4	2.4	30.0
Bromodichloromethane		106.4	80.4	128.2	3.4	30.0
Dibromomethane		108.7	76.9	122.1	1.2	30.0
cis-1,3-Dichloropropene		110.2	79.8	129.9	4.5	30.0
Toluene		101.7	79.8	124.5	1.8	30.0
trans-1,3-Dichloropropene		109.9	74.0	131.3	0.6	30.0
1,1,2-Trichloroethane		108.0	78.7	123.1	0.8	30.0
Tetrachloroethene		102.0	74.5	124.5	0.0	30.0
trans-1,4-Dichloro-2-butene		102.6	68.6	135.4	11.0	30.0
Dibromochloromethane		106.5	74.6	127.2	0.5	30.0
1,2-Dibromoethane		109.1	70.3	133.7	4.1	30.0
Chlorobenzene		99.8	79.2	122.7	0.5	30.0

Organics - Volatiles, Prep Batch ID: VF231108W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 231108B7.LCSDW08B, Parent Sample ID: 231108B7.LCSW08B

Run in Batch: 231108B7, Run Date: 11/09/2023 00:50, Prep Date: 11/08/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		104.6	80.3	128.2	1.4	30.0
Ethylbenzene		100.0	79.5	129.1	1.3	30.0
p,m-Xylene		97.4	79.4	132.2	0.5	30.0
o-Xylene		98.2	80.2	131.0	0.7	30.0
Styrene		100.0	69.5	126.7	0.8	30.0
Isopropylbenzene		99.9	74.4	121.5	2.4	30.0
Bromoform		106.7	69.4	128.0	5.9	30.0
1,1,2,2-Tetrachloroethane		108.0	79.8	126.3	7.5	30.0
1,2,3-Trichloropropane		108.4	78.3	138.8	8.8	30.0
n-Propylbenzene		99.6	82.0	130.7	2.0	30.0
Bromobenzene		101.0	78.7	124.6	0.1	30.0
1,3,5-Trimethylbenzene		100.3	81.3	128.9	2.1	30.0
tert-Butylbenzene		97.9	80.7	128.9	2.3	30.0
1,2,4-Trimethylbenzene		99.6	81.4	130.8	2.2	30.0
sec-Butylbenzene		102.3	77.4	129.8	5.6	30.0
p-Isopropyltoluene		100.6	79.8	137.5	5.5	30.0
1,3-Dichlorobenzene		101.5	77.0	131.3	2.4	30.0
1,4-Dichlorobenzene		101.8	20.7	137.7	0.9	30.0
1,2-Dichlorobenzene		103.6	10.0	166.2	2.6	30.0
1,2,3-Trimethylbenzene		102.2	76.3	124.2	2.1	30.0
n-Butylbenzene		101.5	80.0	133.3	5.4	30.0
Hexachloroethane		114.3	23.8	138.1	6.4	30.0
1,2-Dibromo-3-chloropropane		130.1	21.2	189.4	18.7	30.0
1,2,4-Trichlorobenzene		111.7	27.4	143.4	3.7	30.0
1,2,3-Trichlorobenzene		118.2	75.4	131.4	7.9	30.0
Naphthalene		122.8	32.9	135.8	15.3	30.0
2-Methylnaphthalene		119.0	25.5	165.5	22.8	30.0

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.81	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.8	70.0	130.0	28.7	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55263
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing GWS
Submitted: 11/02/2023 08:00 Login User: BJB

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 6

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Dunn

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55263.01	10/30/23	1030	MW-21-141-103023	GW	3		3						X	
.02	10/30/23	1205	MW-02-02(6)_103023	GW	3		3						X	
.03	10/30/23	1340	MW-03-05_103023	GW	3		3						X	
.04	10/30/23	1510	MW-03-06_103023	GW	3		3						X	
11/2/2023 BSB .05	~~10/30/23~~		~~MW-04-04R_103023~~	~~GW~~	~~3~~		~~3~~						~~X~~	
.05	10/31/23	1230	MW-04-05(6)_103123	GW	3		3							X
.06	10/30/23	—	Trip Blank	GW	1		1							X
.07	10/30/23	—	DUP-11_103023	GW	3		3						X	
.08	10/30/23	—	DUP-13_103023	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler	DATE: 11/2/23	TIME: 0800	RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit DropBox
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/2/23	TIME: 0800	RECEIVED BY: SIGNATURE/ORGANIZATION: Barbie Ball
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	DATE: 11/7/23 TIME: 0800
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	DATE: 11/7/23 TIME: 0800

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55264.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55264.01-S55264.06
Project: 30171056.0470B / RACER Lansing GWS
Collected Date(s): 10/30/2023
Submitted Date/Time: 11/02/2023 08:00
Sampled by: Billy Cobern
P.O. #: US3460011467

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55264.01	PW-14-01_103023	Groundwater	10/30/23 09:45
S55264.02	MW-20-129_103023	Groundwater	10/30/23 10:55
S55264.03	MW-19-122_103023	Groundwater	10/30/23 12:30
S55264.04	MW-19-124_103023	Groundwater	10/30/23 14:10
S55264.05	MW-21-142_103023	Groundwater	10/30/23 15:50
S55264.06	MW-20-126_103023	Groundwater	10/30/23 17:00

Lab Sample ID: S55264.01
Sample Tag: PW-14-01_103023
Collected Date/Time: 10/30/2023 09:45
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.02
Sample Tag: MW-20-129_103023
Collected Date/Time: 10/30/2023 10:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 07:03, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	71	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.03
Sample Tag: MW-19-122_103023
Collected Date/Time: 10/30/2023 12:30
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 07:25, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.04
Sample Tag: MW-19-124_103023
Collected Date/Time: 10/30/2023 14:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:58, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	143	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.05
Sample Tag: MW-21-142_103023
Collected Date/Time: 10/30/2023 15:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 08:07, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	70	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.06
Sample Tag: MW-20-126_103023
Collected Date/Time: 10/30/2023 17:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 08:28, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	63	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55264.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55264.01-S55264.06
Project: 30171056.0470B / RACER Lansing GWS
Submitted Date/Time: 11/02/2023 08:00
Sampled by: Billy Cobern
P.O. #: US3460011467

QC Report Sections

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Internal Standards per QC Sample (Pages 28-29)
Batch QC Results (Pages 30-31)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55264.01
Sample Tag: PW-14-01_103023
Collected Date/Time: 10/30/2023 09:45
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 06:42	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55264.02
Sample Tag: MW-20-129_103023
Collected Date/Time: 10/30/2023 10:55
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 07:03	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55264.03
Sample Tag: MW-19-122_103023
Collected Date/Time: 10/30/2023 12:30
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 07:25	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55264.04
Sample Tag: MW-19-124_103023
Collected Date/Time: 10/30/2023 14:10
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 15:58	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55264.05
Sample Tag: MW-21-142_103023
Collected Date/Time: 10/30/2023 15:50
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 08:07	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S55264.06
Sample Tag: MW-20-126_103023
Collected Date/Time: 10/30/2023 17:00
Matrix: Groundwater
COC Reference: 1

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/08/23 08:28	231107B9	VS231107W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55264.01	1,4-Dioxane	SW8260B - SIM	11/08/23 06:42	231107B9
S55264.02	1,4-Dioxane	SW8260B - SIM	11/08/23 07:03	231107B9
S55264.03	1,4-Dioxane	SW8260B - SIM	11/08/23 07:25	231107B9
S55264.05	1,4-Dioxane	SW8260B - SIM	11/08/23 08:07	231107B9
S55264.06	1,4-Dioxane	SW8260B - SIM	11/08/23 08:28	231107B9

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55264.04	1,4-Dioxane	SW8260B - SIM	11/09/23 15:58	231109A9

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.01

Sample Tag: PW-14-01_103023

Collected Date/Time: 10/30/2023 09:45

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 06:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.02

Sample Tag: MW-20-129_103023

Collected Date/Time: 10/30/2023 10:55

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 07:03, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.03

Sample Tag: MW-19-122_103023

Collected Date/Time: 10/30/2023 12:30

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 07:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.04

Sample Tag: MW-19-124_103023

Collected Date/Time: 10/30/2023 14:10

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 15:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.05

Sample Tag: MW-21-142_103023

Collected Date/Time: 10/30/2023 15:50

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 08:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55264.06

Sample Tag: MW-20-126_103023

Collected Date/Time: 10/30/2023 17:00

Matrix: Groundwater

COC Reference: 1

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231107B9, Run Date: 11/08/2023 08:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**112.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**80.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231107W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231107B9.BLKS07B

Run in Batch: 231107B9, Run Date: 11/08/2023 00:46, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.81	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:23, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231107B9.LCSDS07B, Parent Sample ID: 231107B9.LCSS07B

Run in Batch: 231107B9, Run Date: 11/07/2023 23:44, Prep Date: 11/07/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		115.8	70.0	130.0	28.7	30.0

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.29	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		74.3	70.0	130.0	17.7	30.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	67.8	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		77.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	58.3	70.0	130.0	3.2	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.1	70.0	130.0	4.2	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55264
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing GWS
Submitted: 11/02/2023 08:00 Login User: BJB

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Brit Cobean

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55264.01	10/30/23	945	PW-14-01_103023	GW	3		3						X				
02	10/30/23	1055	MW-20-129_103023	GW	3		3						X				
.03	10/30/23	1230	MW-19-122_103023	GW	3		3						X				
.04	10/30/23	1410	MW-19-124_103023	GW	3		3						X				
.05	10/30/23	1550	MW-21-142_103023	GW	3		3						X				
.06	10/30/23	1700	MW-20-126_103023	GW	3		3						X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis (Sampler)	DATE: 11/2/23	TIME: 0800	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/2/23	TIME: 0800	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Dropbox	DATE: 11/7/2023	TIME: 0800	
RECEIVED BY: SIGNATURE/ORGANIZATION: Barton Ball	DATE: 11/7/2023	TIME: 0800	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL: 5.8
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55364.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55364.01-S55364.10
Project: 30171056.0470B / RACER Lansing GWS
Collected Date(s): 11/01/2023 - 11/02/2023
Submitted Date/Time: 11/03/2023 09:30
Sampled by: Billy Cobern
P.O. #: US3460011467

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55364.01	MW-12-21_110123	Groundwater	11/01/23 15:15
S55364.02	MW-12-21_110123 MS	Groundwater	11/01/23 15:15
S55364.03	MW-12-21_110123 MSD	Groundwater	11/01/23 15:15
S55364.04	MW-13-22_110123	Groundwater	11/01/23 16:20
S55364.05	MW-13-48_110223	Groundwater	11/02/23 09:40
S55364.06	MW-13-34_110223	Groundwater	11/02/23 10:55
S55364.07	AS-19-A07_110223	Groundwater	11/02/23 12:00
S55364.08	AS-19-A06_110223	Groundwater	11/02/23 13:10
S55364.09	TW-15-11_110223	Groundwater	11/02/23 14:05
S55364.10	PW-14-03R_110223	Groundwater	11/02/23 15:50

Lab Sample ID: S55364.01
Sample Tag: MW-12-21_110123
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 16:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	118	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.02
Sample Tag: MW-12-21_110123 MS
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	152	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55364.03
Sample Tag: MW-12-21_110123 MSD
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	147	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55364.04
Sample Tag: MW-13-22_110123
Collected Date/Time: 11/01/2023 16:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 16:39, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	135	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.05
Sample Tag: MW-13-48_110223
Collected Date/Time: 11/02/2023 09:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 17:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.06
Sample Tag: MW-13-34_110223
Collected Date/Time: 11/02/2023 10:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 17:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	82	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.07
Sample Tag: AS-19-A07_110223
Collected Date/Time: 11/02/2023 12:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/10/23 14:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.08
Sample Tag: AS-19-A06_110223
Collected Date/Time: 11/02/2023 13:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 18:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.09
Sample Tag: TW-15-11_110223
Collected Date/Time: 11/02/2023 14:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 18:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	108	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.10
Sample Tag: PW-14-03R_110223
Collected Date/Time: 11/02/2023 15:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/10/23 15:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55364.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55364.01-S55364.10
Project: 30171056.0470B / RACER Lansing GWS
Submitted Date/Time: 11/03/2023 09:30
Sampled by: Billy Cobern
P.O. #: US3460011467

QC Report Sections

Cover Page (Page 16)
Analysis Summary (Pages 17-26)
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Surrogates per QC Sample (Pages 28-29)
Internal Standards per Lab Sample (Pages 30-37)
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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S55364.01
Sample Tag: MW-12-21_110123
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 16:19	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.02

Sample Tag: MW-12-21_110123 MS

Collected Date/Time: 11/01/2023 15:15

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 20:51	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.03

Sample Tag: MW-12-21_110123 MSD

Collected Date/Time: 11/01/2023 15:15

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 21:12	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.04
Sample Tag: MW-13-22_110123
Collected Date/Time: 11/01/2023 16:20
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 16:39	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.05
Sample Tag: MW-13-48_110223
Collected Date/Time: 11/02/2023 09:40
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 17:00	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.06
Sample Tag: MW-13-34_110223
Collected Date/Time: 11/02/2023 10:55
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 17:22	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.07
Sample Tag: AS-19-A07_110223
Collected Date/Time: 11/02/2023 12:00
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/10/23 14:49	231110A9	VS231110W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S55364.08
Sample Tag: AS-19-A06_110223
Collected Date/Time: 11/02/2023 13:10
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 18:04	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.09
Sample Tag: TW-15-11_110223
Collected Date/Time: 11/02/2023 14:05
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 18:25	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55364.10

Sample Tag: PW-14-03R_110223

Collected Date/Time: 11/02/2023 15:50

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/10/23 15:10	231110A9	VS231110W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55364.01	1,4-Dioxane	SW8260B - SIM	11/09/23 16:19	231109A9
S55364.02	1,4-Dioxane	SW8260B - SIM	11/09/23 20:51	231109A9
S55364.03	1,4-Dioxane	SW8260B - SIM	11/09/23 21:12	231109A9
S55364.04	1,4-Dioxane	SW8260B - SIM	11/09/23 16:39	231109A9
S55364.05	1,4-Dioxane	SW8260B - SIM	11/09/23 17:00	231109A9
S55364.06	1,4-Dioxane	SW8260B - SIM	11/09/23 17:22	231109A9
S55364.08	1,4-Dioxane	SW8260B - SIM	11/09/23 18:04	231109A9
S55364.09	1,4-Dioxane	SW8260B - SIM	11/09/23 18:25	231109A9

Organics - Volatiles, Prep Batch ID: VS231110W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55364.07	1,4-Dioxane	SW8260B - SIM	11/10/23 14:49	231110A9
S55364.10	1,4-Dioxane	SW8260B - SIM	11/10/23 15:10	231110A9

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS231110W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231110A9.BLKS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 14:29, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:04, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231110A9.LCSDS10A, Parent Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:25, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.01

Sample Tag: MW-12-21_110123

Collected Date/Time: 11/01/2023 15:15

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 16:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.04

Sample Tag: MW-13-22_110123

Collected Date/Time: 11/01/2023 16:20

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 16:39, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.05

Sample Tag: MW-13-48_110223

Collected Date/Time: 11/02/2023 09:40

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 17:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.06

Sample Tag: MW-13-34_110223

Collected Date/Time: 11/02/2023 10:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 17:22, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.07

Sample Tag: AS-19-A07_110223

Collected Date/Time: 11/02/2023 12:00

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231110A9, Run Date: 11/10/2023 14:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.08

Sample Tag: AS-19-A06_110223

Collected Date/Time: 11/02/2023 13:10

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 18:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.09

Sample Tag: TW-15-11_110223

Collected Date/Time: 11/02/2023 14:05

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 18:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55364.10

Sample Tag: PW-14-03R_110223

Collected Date/Time: 11/02/2023 15:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231110A9, Run Date: 11/10/2023 15:10, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231110W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231110A9.BLKS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 14:29, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**103.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:04, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**99.8**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231110A9.LCSDS10A, Parent Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:25, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**93.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.29	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		74.3	70.0	130.0	17.7	30.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	67.8	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		77.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	58.3	70.0	130.0	3.2	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.1	70.0	130.0	4.2	30.0

Organics - Volatiles, Prep Batch ID: VS231110W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 231110A9.BLKS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 14:29, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.46	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:04, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231110A9.LCSDS10A, Parent Sample ID: 231110A9.LCSS10A

Run in Batch: 231110A9, Run Date: 11/10/2023 13:25, Prep Date: 11/10/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		88.8	70.0	130.0	0.4	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55364
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470B / RACER Lansing GWS
Submitted: 11/03/2023 09:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Bill Cobean

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000	Special Instructions
.01/.02/.03	11/1/23	1515	MW-12-21_110123	GW	9		9						X					MS/MSD
55364.04	11/1/23	1620	MW-13-22_110123	GW	3		3						X					
.05	11/2/23	940	MW-13-48_110223	GW	3		3						X					
.06	11/2/23	1055	MW-13-34_110223	GW	3		3						X					
.07	11/2/23	1200	AS-19A07_110223	GW	3		3						X					
.08	11/2/23	1310	AS-19A06_110223	GW	3		3						X					
.09	11/2/23	1405	TW-15-11_110223	GW	3		3						X					
.10	11/2/23	1550	PW-14-03R_110223	GW	3		3						X					

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler	DATE: 11/3/23	TIME: 0930	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/3/23	TIME: 0930	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/3/23	TIME: 0930	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE: 11/3/23	TIME: 0930	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S55365.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Addtional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S55365.01-S55365.07
Project: 30171056.0470A / RACER Lansing GWS
Collected Date(s): 11/01/2023 - 11/02/2023
Submitted Date/Time: 11/03/2023 09:30
Sampled by: Donald Richmond
P.O. #: US3460011441

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S55365.01	MW-13-27_110123	Groundwater	11/01/23 16:05
S55365.02	MW-13-23_110123	Groundwater	11/01/23 10:35
S55365.03	MW-13-25_110223	Groundwater	11/02/23 11:50
S55365.04	MW-13-25_110223 MS	Groundwater	11/02/23 11:50
S55365.05	MW-13-25_110223 MSD	Groundwater	11/02/23 11:50
S55365.06	MW-13-46_110223	Groundwater	11/02/23 13:55
S55365.07	Dup-08_110223	Groundwater	11/02/23 00:01

Analytical Laboratory Report

Lab Sample ID: S55365.01
Sample Tag: MW-13-27_110123
Collected Date/Time: 11/01/2023 16:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.02
Sample Tag: MW-13-23_110123
Collected Date/Time: 11/01/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.03
Sample Tag: MW-13-25_110223
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.04
Sample Tag: MW-13-25_110223 MS
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	40	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S55365.05
Sample Tag: MW-13-25_110223 MSD
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	42	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S55365.06
Sample Tag: MW-13-46_110223
Collected Date/Time: 11/02/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.07
Sample Tag: Dup-08_110223
Collected Date/Time: 11/02/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:31, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S55365.01(01)+QC01
Generated on 11/10/2023

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S55365.01-S55365.07
Project: 30171056.0470A / RACER Lansing GWS
Submitted Date/Time: 11/03/2023 09:30
Sampled by: Donald Richmond
P.O. #: US3460011441

QC Report Sections

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Analysis Summary (Pages 14-20)
Prep Batch Summary (Page 21)
Surrogates per QC Sample (Page 22)
Internal Standards per Lab Sample (Pages 23-27)
Internal Standards per QC Sample (Page 28)
Batch QC Results (Page 29)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S55365.01
Sample Tag: MW-13-27_110123
Collected Date/Time: 11/01/2023 16:05
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 19:06	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.02
Sample Tag: MW-13-23_110123
Collected Date/Time: 11/01/2023 10:35
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 19:27	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.03
Sample Tag: MW-13-25_110223
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 19:49	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.04

Sample Tag: MW-13-25_110223 MS

Collected Date/Time: 11/02/2023 11:50

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 21:34	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.05

Sample Tag: MW-13-25_110223 MSD

Collected Date/Time: 11/02/2023 11:50

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 21:55	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.06
Sample Tag: MW-13-46_110223
Collected Date/Time: 11/02/2023 13:55
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 20:09	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S55365.07
Sample Tag: Dup-08_110223
Collected Date/Time: 11/02/2023 00:01
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/09/23 20:31	231109A9	VS231109W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S55365.01	1,4-Dioxane	SW8260B - SIM	11/09/23 19:06	231109A9
S55365.02	1,4-Dioxane	SW8260B - SIM	11/09/23 19:27	231109A9
S55365.03	1,4-Dioxane	SW8260B - SIM	11/09/23 19:49	231109A9
S55365.04	1,4-Dioxane	SW8260B - SIM	11/09/23 21:34	231109A9
S55365.05	1,4-Dioxane	SW8260B - SIM	11/09/23 21:55	231109A9
S55365.06	1,4-Dioxane	SW8260B - SIM	11/09/23 20:09	231109A9
S55365.07	1,4-Dioxane	SW8260B - SIM	11/09/23 20:31	231109A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55365.01

Sample Tag: MW-13-27_110123

Collected Date/Time: 11/01/2023 16:05

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 19:06, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55365.02

Sample Tag: MW-13-23_110123

Collected Date/Time: 11/01/2023 10:35

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 19:27, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**91.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55365.03

Sample Tag: MW-13-25_110223

Collected Date/Time: 11/02/2023 11:50

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 19:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55365.06

Sample Tag: MW-13-46_110223

Collected Date/Time: 11/02/2023 13:55

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 20:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S55365.07

Sample Tag: Dup-08_110223

Collected Date/Time: 11/02/2023 00:01

Matrix: Groundwater

COC Reference:

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 231109A9, Run Date: 11/09/2023 20:31, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.2**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS231109W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**110.8**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.4**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.9**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.6**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.8**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**92.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS231109W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 231109A9.BLKS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 14:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.29	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:31, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		88.7	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 231109A9.LCSDS09A, Parent Sample ID: 231109A9.LCSS09A

Run in Batch: 231109A9, Run Date: 11/09/2023 13:52, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		74.3	70.0	130.0	17.7	30.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536402M, Parent Sample ID: S55364.01

Run in Batch: 231109A9, Run Date: 11/09/2023 20:51, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	67.8	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 231109A9.5536504M, Parent Sample ID: S55365.03

Run in Batch: 231109A9, Run Date: 11/09/2023 21:34, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		77.7	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536403N, Parent Sample ID: 231109A9.5536402M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:12, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	58.3	70.0	130.0	3.2	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 231109A9.5536505N, Parent Sample ID: 231109A9.5536504M

Run in Batch: 231109A9, Run Date: 11/09/2023 21:55, Prep Date: 11/09/2023, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.1	70.0	130.0	4.2	30.0

Merit Laboratories Login Checklist

Lab Set ID: S55365
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30171056.0470A / RACER Lansing GWS
Submitted: 11/03/2023 09:30 Login User: MMC

Attention: Kaitlyn Hunt
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 6.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
553650.01	11/1/23	1605	MW-13-27_110123	GW	3		3						X	
.02	11/2/23	1035	MW-13-23_110223	GW	3		3						X	
03/.04/.05	11/2/23	1150	MW-13-25_110223	GW	9		9						X	
.06	11/2/23	1355	MW-13-46_110223	GW	3		3						X	
.07	11/2/23	—	DUP-08_110223	GW	3		3						X	

Special Instructions: MS/MSD

RELINQUISHED BY: SIGNATURE/ORGANIZATION (Sampler)	Arcadis	DATE 11/3/23	TIME 0930
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 11/3/23	TIME 0930
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Prof. Box	DATE 11/3/23	TIME 0930
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 11/3/23	TIME 0930
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YJ31018**

Date Completed:12/05/2023

12/05/2023 2:20 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YJ31018

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YJ31018-003, YJ31018-013, YJ31018-017, YJ31018-018, YJ31018-019 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

For sample YJ31018-003 sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Surrogate recovery may be adversely affected.

Surrogate recovery for the following samples was outside the upper control limit: YJ31018-001, YJ31018-003, YJ31018-005, YJ31018-006, YJ31018-009, YJ31018-011, YJ31018-013, YJ31018-016, YJ31018-017, YJ31018-018. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside control limits: YJ31018-004, YJ31018-010. Re-extraction and/or re-analysis was performed and all data has been reported.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YJ31018

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-14-58R_102423	Aqueous	10/24/2023 1300	10/31/2023
002	EB-01_102423	Aqueous	10/24/2023 1645	10/31/2023
003	P2-MW-02_102523	Aqueous	10/25/2023 1030	10/31/2023
004	MW-21-139_102523	Aqueous	10/25/2023 1205	10/31/2023
005	P2-MW-04_102523	Aqueous	10/25/2023 1335	10/31/2023
006	MW-14-59_102523	Aqueous	10/25/2023 1425	10/31/2023
007	EB-02_102523	Aqueous	10/25/2023 1500	10/31/2023
008	MW-14-61_102623	Aqueous	10/26/2023 1010	10/31/2023
009	MW-14-60_102623	Aqueous	10/26/2023 0955	10/31/2023
010	MW-14-62_102623	Aqueous	10/26/2023 1050	10/31/2023
011	MW-12-18_102623	Aqueous	10/26/2023 1225	10/31/2023
012	DUP-02_102623	Aqueous	10/26/2023	10/31/2023
013	MW-12-09_102623	Aqueous	10/26/2023 1345	10/31/2023
014	EB-03_102723	Aqueous	10/27/2023 0955	10/31/2023
015	MW-14-56_102723	Aqueous	10/27/2023 1045	10/31/2023
016	MW-20-130_102723	Aqueous	10/27/2023 1225	10/31/2023
017	MW-16-81_102723	Aqueous	10/27/2023 1340	10/31/2023
018	MW-15-72_102723	Aqueous	10/27/2023 1505	10/31/2023
019	DUP-04_102723	Aqueous	10/27/2023	10/31/2023

(19 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YJ31018

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-14-58R_102423	Aqueous	PFHxS	PFAS by ID	2.7	J	ng/L	11
001	MW-14-58R_102423	Aqueous	PFBA	PFAS by ID	11		ng/L	11
001	MW-14-58R_102423	Aqueous	PFHpA	PFAS by ID	7.3		ng/L	11
001	MW-14-58R_102423	Aqueous	PFHxA	PFAS by ID	8.4		ng/L	11
001	MW-14-58R_102423	Aqueous	PFOA	PFAS by ID	16		ng/L	11
001	MW-14-58R_102423	Aqueous	PFPeA	PFAS by ID	7.3		ng/L	11
001	MW-14-58R_102423	Aqueous	PFOS	PFAS by ID	4.2		ng/L	11
003	P2-MW-02_102523	Aqueous	PFBA	PFAS by ID	3.4	J	ng/L	15
003	P2-MW-02_102523	Aqueous	PFDoA	PFAS by ID	0.82	J	ng/L	15
003	P2-MW-02_102523	Aqueous	PFHpA	PFAS by ID	1.1	J	ng/L	15
003	P2-MW-02_102523	Aqueous	PFHxA	PFAS by ID	6.2		ng/L	15
003	P2-MW-02_102523	Aqueous	PFOA	PFAS by ID	1.8	J	ng/L	15
003	P2-MW-02_102523	Aqueous	PFPeA	PFAS by ID	4.9		ng/L	15
003	P2-MW-02_102523	Aqueous	PFOS	PFAS by ID	3.1	J	ng/L	15
004	MW-21-139_102523	Aqueous	8:2 FTS	PFAS by ID	55		ng/L	17
004	MW-21-139_102523	Aqueous	6:2 FTS	PFAS by ID	53	Q	ng/L	17
004	MW-21-139_102523	Aqueous	PFBS	PFAS by ID	21		ng/L	17
004	MW-21-139_102523	Aqueous	PFHpS	PFAS by ID	29		ng/L	17
004	MW-21-139_102523	Aqueous	PFNS	PFAS by ID	0.66	J	ng/L	17
004	MW-21-139_102523	Aqueous	PFPeS	PFAS by ID	30		ng/L	17
004	MW-21-139_102523	Aqueous	PFHxS	PFAS by ID	300		ng/L	17
004	MW-21-139_102523	Aqueous	PFBA	PFAS by ID	48		ng/L	17
004	MW-21-139_102523	Aqueous	PFDA	PFAS by ID	7.6		ng/L	17
004	MW-21-139_102523	Aqueous	PFHpA	PFAS by ID	73		ng/L	17
004	MW-21-139_102523	Aqueous	PFHxA	PFAS by ID	92		ng/L	17
004	MW-21-139_102523	Aqueous	PFNA	PFAS by ID	22		ng/L	17
004	MW-21-139_102523	Aqueous	PFOA	PFAS by ID	100		ng/L	17
004	MW-21-139_102523	Aqueous	PFPeA	PFAS by ID	91		ng/L	17
004	MW-21-139_102523	Aqueous	PFOS	PFAS by ID	2100	E	ng/L	17
005	P2-MW-04_102523	Aqueous	PFHxS	PFAS by ID	3.9		ng/L	23
005	P2-MW-04_102523	Aqueous	PFBA	PFAS by ID	11		ng/L	23
005	P2-MW-04_102523	Aqueous	PFDA	PFAS by ID	2.1	J	ng/L	23
005	P2-MW-04_102523	Aqueous	PFHpA	PFAS by ID	9.7		ng/L	23
005	P2-MW-04_102523	Aqueous	PFHxA	PFAS by ID	13		ng/L	23
005	P2-MW-04_102523	Aqueous	PFNA	PFAS by ID	3.6		ng/L	23
005	P2-MW-04_102523	Aqueous	PFOA	PFAS by ID	23		ng/L	23
005	P2-MW-04_102523	Aqueous	PFOS	PFAS by ID	31		ng/L	23
006	MW-14-59_102523	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	25
006	MW-14-59_102523	Aqueous	PFHxS	PFAS by ID	3.1	J	ng/L	25
006	MW-14-59_102523	Aqueous	PFBA	PFAS by ID	15		ng/L	25
006	MW-14-59_102523	Aqueous	PFHpA	PFAS by ID	8.8		ng/L	25
006	MW-14-59_102523	Aqueous	PFHxA	PFAS by ID	18		ng/L	25
006	MW-14-59_102523	Aqueous	PFOA	PFAS by ID	15		ng/L	25

Detection Summary (Continued)

Lot Number: YJ31018

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	MW-14-59_102523	Aqueous	PFPeA	PFAS by ID	13		ng/L	25
006	MW-14-59_102523	Aqueous	PFOS	PFAS by ID	2.8	J	ng/L	25
008	MW-14-61_102623	Aqueous	PFBA	PFAS by ID	0.95	J	ng/L	29
008	MW-14-61_102623	Aqueous	PFPeA	PFAS by ID	0.68	J	ng/L	29
009	MW-14-60_102623	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	31
009	MW-14-60_102623	Aqueous	PFHxS	PFAS by ID	7.9		ng/L	31
009	MW-14-60_102623	Aqueous	PFBA	PFAS by ID	27		ng/L	31
009	MW-14-60_102623	Aqueous	PFDA	PFAS by ID	1.8	J	ng/L	31
009	MW-14-60_102623	Aqueous	PFHpA	PFAS by ID	16		ng/L	31
009	MW-14-60_102623	Aqueous	PFHxA	PFAS by ID	24		ng/L	31
009	MW-14-60_102623	Aqueous	PFNA	PFAS by ID	5.1		ng/L	31
009	MW-14-60_102623	Aqueous	PFOA	PFAS by ID	41		ng/L	31
009	MW-14-60_102623	Aqueous	PFPeA	PFAS by ID	18		ng/L	31
009	MW-14-60_102623	Aqueous	PFOS	PFAS by ID	44		ng/L	31
010	MW-14-62_102623	Aqueous	8:2 FTS	PFAS by ID	4.2	JQ	ng/L	33
010	MW-14-62_102623	Aqueous	6:2 FTS	PFAS by ID	17	Q	ng/L	33
010	MW-14-62_102623	Aqueous	EtFOSAA	PFAS by ID	1.6	J	ng/L	33
010	MW-14-62_102623	Aqueous	MeFOSAA	PFAS by ID	0.94	J	ng/L	33
010	MW-14-62_102623	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	33
010	MW-14-62_102623	Aqueous	PFOSA	PFAS by ID	4.0		ng/L	33
010	MW-14-62_102623	Aqueous	PFPeS	PFAS by ID	1.1	J	ng/L	33
010	MW-14-62_102623	Aqueous	PFHxS	PFAS by ID	7.5		ng/L	33
010	MW-14-62_102623	Aqueous	PFDA	PFAS by ID	2.4	J	ng/L	33
010	MW-14-62_102623	Aqueous	PFHpA	PFAS by ID	25		ng/L	33
010	MW-14-62_102623	Aqueous	PFHxA	PFAS by ID	25		ng/L	33
010	MW-14-62_102623	Aqueous	PFNA	PFAS by ID	7.7		ng/L	33
010	MW-14-62_102623	Aqueous	PFOA	PFAS by ID	59		ng/L	33
010	MW-14-62_102623	Aqueous	PFPeA	PFAS by ID	20	Q	ng/L	33
010	MW-14-62_102623	Aqueous	PFOS	PFAS by ID	54		ng/L	33
011	MW-12-18_102623	Aqueous	PFBS	PFAS by ID	0.77	J	ng/L	37
011	MW-12-18_102623	Aqueous	PFHxS	PFAS by ID	0.86	J	ng/L	37
011	MW-12-18_102623	Aqueous	PFBA	PFAS by ID	8.4		ng/L	37
011	MW-12-18_102623	Aqueous	PFHpA	PFAS by ID	3.4	J	ng/L	37
011	MW-12-18_102623	Aqueous	PFHxA	PFAS by ID	5.3		ng/L	37
011	MW-12-18_102623	Aqueous	PFOA	PFAS by ID	2.2	J	ng/L	37
011	MW-12-18_102623	Aqueous	PFPeA	PFAS by ID	5.3		ng/L	37
012	DUP-02_102623	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	39
012	DUP-02_102623	Aqueous	PFHxS	PFAS by ID	1.0	J	ng/L	39
012	DUP-02_102623	Aqueous	PFBA	PFAS by ID	8.3		ng/L	39
012	DUP-02_102623	Aqueous	PFHpA	PFAS by ID	3.2	J	ng/L	39
012	DUP-02_102623	Aqueous	PFHxA	PFAS by ID	5.3		ng/L	39
012	DUP-02_102623	Aqueous	PFOA	PFAS by ID	2.3	J	ng/L	39
012	DUP-02_102623	Aqueous	PFPeA	PFAS by ID	5.3		ng/L	39
013	MW-12-09_102623	Aqueous	PFBS	PFAS by ID	2.1	J	ng/L	41
013	MW-12-09_102623	Aqueous	PFHxS	PFAS by ID	3.8		ng/L	41
013	MW-12-09_102623	Aqueous	PFBA	PFAS by ID	15		ng/L	41
013	MW-12-09_102623	Aqueous	PFHpA	PFAS by ID	11		ng/L	41
013	MW-12-09_102623	Aqueous	PFHxA	PFAS by ID	14		ng/L	41

Detection Summary (Continued)

Lot Number: YJ31018

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
013	MW-12-09_102623	Aqueous	PFNA	PFAS by ID	0.75	J	ng/L	41
013	MW-12-09_102623	Aqueous	PFOA	PFAS by ID	16		ng/L	41
013	MW-12-09_102623	Aqueous	PFPeA	PFAS by ID	13		ng/L	41
013	MW-12-09_102623	Aqueous	PFOS	PFAS by ID	3.3	J	ng/L	41
015	MW-14-56_102723	Aqueous	PFBA	PFAS by ID	7.3		ng/L	45
015	MW-14-56_102723	Aqueous	PFHxA	PFAS by ID	1.8	J	ng/L	45
015	MW-14-56_102723	Aqueous	PFOA	PFAS by ID	0.91	J	ng/L	45
015	MW-14-56_102723	Aqueous	PFPeA	PFAS by ID	8.3		ng/L	45
015	MW-14-56_102723	Aqueous	PFOS	PFAS by ID	1.7	J	ng/L	45
016	MW-20-130_102723	Aqueous	PFBS	PFAS by ID	39		ng/L	47
016	MW-20-130_102723	Aqueous	PFPeS	PFAS by ID	13		ng/L	47
016	MW-20-130_102723	Aqueous	PFHxS	PFAS by ID	8.3		ng/L	47
016	MW-20-130_102723	Aqueous	PFBA	PFAS by ID	30		ng/L	47
016	MW-20-130_102723	Aqueous	PFHpA	PFAS by ID	17		ng/L	47
016	MW-20-130_102723	Aqueous	PFHxA	PFAS by ID	70		ng/L	47
016	MW-20-130_102723	Aqueous	PFOA	PFAS by ID	6.6		ng/L	47
016	MW-20-130_102723	Aqueous	PFPeA	PFAS by ID	45		ng/L	47
017	MW-16-81_102723	Aqueous	PFBA	PFAS by ID	5.8		ng/L	49
017	MW-16-81_102723	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	49
017	MW-16-81_102723	Aqueous	PFHxA	PFAS by ID	2.8	J	ng/L	49
017	MW-16-81_102723	Aqueous	PFOA	PFAS by ID	0.79	J	ng/L	49
017	MW-16-81_102723	Aqueous	PFPeA	PFAS by ID	4.6		ng/L	49
018	MW-15-72_102723	Aqueous	PFBA	PFAS by ID	6.5		ng/L	51
018	MW-15-72_102723	Aqueous	PFHxA	PFAS by ID	2.1	J	ng/L	51
018	MW-15-72_102723	Aqueous	PFPeA	PFAS by ID	4.1		ng/L	51
019	DUP-04_102723	Aqueous	PFBA	PFAS by ID	7.9		ng/L	53
019	DUP-04_102723	Aqueous	PFHxA	PFAS by ID	2.2	J	ng/L	53
019	DUP-04_102723	Aqueous	PFPeA	PFAS by ID	9.3		ng/L	53

(119 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-001**

Description: **MW-14-58R_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1300** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1611	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.5	0.39	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.5	0.54	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.5	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.5	1.6	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.5	0.72	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.5	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.5	0.61	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.5	0.76	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.34	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.64	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.41	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.58	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.3**	**0.49**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.43	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.3**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.4**		**3.3**	**0.56**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.3	0.38	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.3**	**0.68**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.3**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.43	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.2**		**3.3**	**1.6**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	203	25-150
13C2_6:2FTS	N	231	25-150
13C2_8:2FTS	N	183	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		32	25-150
13C4_PFHpA		65	25-150
13C5_PFHxA		69	25-150
13C5_PFPeA		53	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-001**

Description: **MW-14-58R_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1300** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-002**

Description: **EB-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1622	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		94	25-150
13C4_PFHpA		92	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-002**

Description: **EB-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-003**

Description: **P2-MW-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1030** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1632	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	0.67	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	0.88	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	0.76	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	0.94	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	0.42	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.79	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.72	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.62	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.0	0.56	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.4**	**J**	**4.0**	**0.61**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.82**	**J**	**4.0**	**0.48**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.1**	**J**	**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.2**		**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.8**	**J**	**4.0**	**0.84**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.9**		**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	200	25-150
13C2_6:2FTS	N	203	25-150
13C2_8:2FTS		132	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		69	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		90	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-003**

Description: **P2-MW-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1030** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**55**		**6.9**	**1.4**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**53**	**Q**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**21**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**29**		**3.5**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	**68259-12-1**	**PFAS by ID SOP**	**0.66**	**J**	**3.5**	**0.62**	**ng/L**	**1**
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**30**		**3.5**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**300**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**48**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.6**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**73**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**92**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**22**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**91**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2100**	**E**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		69	4.2	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		69	5.7	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**48**	**J**	**69**	**14**	**ng/L**	**2**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**52**	**J**	**69**	**17**	**ng/L**	**2**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	69	7.6	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		69	18	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		69	4.2	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		69	6.5	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		69	8.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**20**	**J**	**35**	**3.6**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		35	6.7	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**32**	**J**	**35**	**4.3**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		35	6.2	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		35	5.3	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**29**	**J**	**35**	**5.1**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**290**		**35**	**4.8**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**52**		**35**	**5.2**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**6.9**	**J**	**35**	**4.5**	**ng/L**	**2**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		35	4.1	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**78**		**35**	**3.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**98**		**35**	**6.0**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**22**	**J**	**35**	**4.0**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**		**35**	**7.2**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**93**		**35**	**4.7**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		35	5.2	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		35	4.6	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		35	5.4	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2300**		**35**	**17**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**57**		**6.9**	**1.4**	**ng/L**	**3**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**65**	**Q**	**6.9**	**1.7**	**ng/L**	**3**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**22**		**3.4**	**0.36**	**ng/L**	**3**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	3
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**39**		**3.4**	**0.43**	**ng/L**	**3**
Perfluoro-1-nonanesulfonic acid (PFNS)	**68259-12-1**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.61**	**ng/L**	**3**
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.53**	**ng/L**	**3**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**28**		**3.4**	**0.51**	**ng/L**	**3**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**340**	**E**	**3.4**	**0.47**	**ng/L**	**3**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**53**		**3.4**	**0.52**	**ng/L**	**3**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.45**	**ng/L**	**3**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**79**		**3.4**	**0.38**	**ng/L**	**3**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**100**		**3.4**	**0.59**	**ng/L**	**3**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**23**		**3.4**	**0.40**	**ng/L**	**3**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**120**		**3.4**	**0.71**	**ng/L**	**3**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**96**		**3.4**	**0.47**	**ng/L**	**3**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2300**	**E**	**3.4**	**1.7**	**ng/L**	**3**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-005**

Description: **P2-MW-04_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1715	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.7**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.6**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**31**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	218	25-150
13C2_6:2FTS	N	228	25-150
13C2_8:2FTS	N	208	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		62	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		49	25-150
13C4_PFBA		30	25-150
13C4_PFHpA		59	25-150
13C5_PFHxA		55	25-150
13C5_PFPeA		43	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-005**

Description: **P2-MW-04_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	25-150
13C8_PFOS		71	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		73	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-006**

Description: **MW-14-59_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1410	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.8**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**18**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**15**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	221	25-150
13C2_6:2FTS	N	258	25-150
13C2_8:2FTS		123	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		35	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		70	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-006**
Description: **MW-14-59_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1425**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-007**

Description: **EB-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1500** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1421	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS		89	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-007**

Description: **EB-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1500** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-008**

Description: **MW-14-61_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1010** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1432	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.68**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-008**

Description: **MW-14-61_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1010** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-009**

Description: **MW-14-60_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1442	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**27**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.1**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**41**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**44**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	275	25-150
13C2_6:2FTS	N	291	25-150
13C2_8:2FTS	N	210	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		60	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		70	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		63	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-009**
Description: **MW-14-60_102623**
Matrix: **Aqueous**
Date Sampled: **10/26/2023 0955**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		43	25-150
d5-EtFOSAA		119	25-150
d3-MeFOSAA		107	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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DL = Detection Limit
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1453	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1758	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**4.2**	**JQ**	**6.8**	**1.4**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**17**	**Q**	**6.8**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.6**	**J**	**6.8**	**0.64**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**0.94**	**J**	**6.8**	**0.80**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**4.0**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.4**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**25**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.7**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**59**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**20**	**Q**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**54**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	253	25-150	N	232	25-150
13C2_6:2FTS	N	330	25-150	N	290	25-150
13C2_8:2FTS	N	256	25-150	N	266	25-150
13C2_PFDoA		86	25-150		83	25-150
13C2_PFTeDA		74	25-150		56	25-150
13C3_PFBS		77	25-150		78	25-150
13C3_PFHxS		85	25-150		89	25-150
13C3-HFPO-DA		54	25-150		52	25-150
13C4_PFBA	N	2.0	25-150	N	1.0	25-150
13C4_PFHpA		70	25-150		85	25-150
13C5_PFHxA		63	25-150		65	25-150
13C5_PFPeA	N	10	25-150	N	6.0	25-150
13C6_PFDA		89	25-150		99	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	25-150		93	25-150
13C8_PFOA		80	25-150		104	25-150
13C8_PFOS		75	25-150		92	25-150
13C8_PFOSA		84	10-150		88	10-150
13C9_PFNA		86	25-150		102	25-150
d5-EtFOSAA		120	25-150		109	25-150
d3-MeFOSAA		102	25-150		108	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1453	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1758	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**4.8**	**JQ**	**6.8**	**1.4**	**ng/L**	**2**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**17**	**Q**	**6.8**	**1.7**	**ng/L**	**2**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.9**	**J**	**6.8**	**0.64**	**ng/L**	**2**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.35**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.52**	**ng/L**	**2**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.51**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.2**		**3.4**	**0.47**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.4**	**J**	**3.4**	**0.45**	**ng/L**	**2**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**20**		**3.4**	**0.38**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.59**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.1**		**3.4**	**0.40**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**53**		**3.4**	**0.71**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**34**	**Q**	**3.4**	**0.47**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**46**		**3.4**	**1.7**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	253	25-150	N	232	25-150
13C2_6:2FTS	N	330	25-150	N	290	25-150
13C2_8:2FTS	N	256	25-150	N	266	25-150
13C2_PFDoA		86	25-150		83	25-150
13C2_PFTeDA		74	25-150		56	25-150
13C3_PFBS		77	25-150		78	25-150
13C3_PFHxS		85	25-150		89	25-150
13C3-HFPO-DA		54	25-150		52	25-150
13C4_PFBA	N	2.0	25-150	N	1.0	25-150
13C4_PFHpA		70	25-150		85	25-150
13C5_PFHxA		63	25-150		65	25-150
13C5_PFPeA	N	10	25-150	N	6.0	25-150
13C6_PFDA		89	25-150		99	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	25-150		93	25-150
13C8_PFOA		80	25-150		104	25-150
13C8_PFOS		75	25-150		92	25-150
13C8_PFOSA		84	10-150		88	10-150
13C9_PFNA		86	25-150		102	25-150
d5-EtFOSAA		120	25-150		109	25-150
d3-MeFOSAA		102	25-150		108	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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P = The RPD between two GC columns exceeds 40%
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-011**

Description: **MW-12-18_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1504	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.77**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.86**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.4**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.4**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	172	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-011**

Description: **MW-12-18_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-012**

Description: **DUP-02_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1535	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.0**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.3**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.2**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.3**	**J**	**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		71	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-012**

Description: **DUP-02_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-013**

Description: **MW-12-09_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1345** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1546	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.8**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**11**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**14**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.75**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	179	25-150
13C2_6:2FTS		134	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-013**

Description: **MW-12-09_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1345** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-014**

Description: **EB-03_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1557	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.39	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-014**

Description: **EB-03_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-015**

Description: **MW-14-56_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1607	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.3**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.91**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		139	25-150
13C2_6:2FTS		117	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-015**
Description: **MW-14-56_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1045**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-016**

Description: **MW-20-130_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1618	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**39**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**13**		**3.5**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**8.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**30**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**70**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**45**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	236	25-150
13C2_6:2FTS	N	167	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		25	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		48	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		65	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-016**
Description: **MW-20-130_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1225**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-017**

Description: **MW-16-81_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1628	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.79**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	168	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		79	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-017**
Description: **MW-16-81_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1340**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-018**

Description: **MW-15-72_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1505** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1639	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	167	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		65	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		50	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		75	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-018**
Description: **MW-15-72_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1505**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	25-150
13C8_PFOS		69	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		67	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-019**

Description: **DUP-04_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1650	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1809	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.9**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.3**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		132	25-150		149	25-150
13C2_6:2FTS		113	25-150		128	25-150
13C2_8:2FTS		73	25-150		87	25-150
13C2_PFDoA		47	25-150		57	25-150
13C2_PFTeDA	N	18	25-150		47	25-150
13C3_PFBS		88	25-150		93	25-150
13C3_PFHxS		85	25-150		84	25-150
13C3-HFPO-DA		84	25-150		87	25-150
13C4_PFBA		60	25-150		70	25-150
13C4_PFHpA		89	25-150		99	25-150
13C5_PFHxA		89	25-150		106	25-150
13C5_PFPeA		85	25-150		100	25-150
13C6_PFDA		74	25-150		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-019**

Description: **DUP-04_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		64	25-150		72	25-150
13C8_PFOA		80	25-150		108	25-150
13C8_PFOS		77	25-150		89	25-150
13C8_PFOSA		69	10-150		86	10-150
13C9_PFNA		79	25-150		92	25-150
d5-EtFOSAA		70	25-150		74	25-150
d3-MeFOSAA		70	25-150		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ89356-001
Batch: 89356
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/16/2023 2110
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/16/2023 2110
8:2 FTS	ND		1	8.0	1.6	ng/L	11/16/2023 2110
6:2 FTS	ND		1	8.0	2.0	ng/L	11/16/2023 2110
4:2 FTS	ND		1	8.0	0.87	ng/L	11/16/2023 2110
GenX	ND		1	8.0	2.1	ng/L	11/16/2023 2110
ADONA	ND		1	8.0	0.48	ng/L	11/16/2023 2110
EtFOSAA	ND		1	8.0	0.75	ng/L	11/16/2023 2110
MeFOSAA	ND		1	8.0	0.93	ng/L	11/16/2023 2110
PFBS	ND		1	4.0	0.41	ng/L	11/16/2023 2110
PFDS	ND		1	4.0	0.78	ng/L	11/16/2023 2110
PFHpS	ND		1	4.0	0.50	ng/L	11/16/2023 2110
PFNS	ND		1	4.0	0.71	ng/L	11/16/2023 2110
PFOSA	ND		1	4.0	0.61	ng/L	11/16/2023 2110
PFPeS	ND		1	4.0	0.59	ng/L	11/16/2023 2110
PFHxS	ND		1	4.0	0.55	ng/L	11/16/2023 2110
PFBA	ND		1	4.0	0.60	ng/L	11/16/2023 2110
PFDA	ND		1	4.0	0.52	ng/L	11/16/2023 2110
PFDoA	ND		1	4.0	0.47	ng/L	11/16/2023 2110
PFHpA	ND		1	4.0	0.45	ng/L	11/16/2023 2110
PFHxA	ND		1	4.0	0.69	ng/L	11/16/2023 2110
PFNA	ND		1	4.0	0.46	ng/L	11/16/2023 2110
PFOA	ND		1	4.0	0.83	ng/L	11/16/2023 2110
PFPeA	ND		1	4.0	0.54	ng/L	11/16/2023 2110
PFTeDA	ND		1	4.0	0.60	ng/L	11/16/2023 2110
PFTrDA	ND		1	4.0	0.53	ng/L	11/16/2023 2110
PFUdA	ND		1	4.0	0.63	ng/L	11/16/2023 2110
PFOS	ND		1	4.0	2.0	ng/L	11/16/2023 2110

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89356-001
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		96	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89356-002
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	13		1	89	50-150	11/16/2023 2120
11Cl-PF3OUdS	15	13		1	87	50-150	11/16/2023 2120
8:2 FTS	15	19		1	121	50-150	11/16/2023 2120
6:2 FTS	15	12		1	80	50-150	11/16/2023 2120
4:2 FTS	15	15		1	99	50-150	11/16/2023 2120
GenX	32	31		1	97	50-150	11/16/2023 2120
ADONA	15	15		1	100	50-150	11/16/2023 2120
EtFOSAA	16	18		1	111	50-150	11/16/2023 2120
MeFOSAA	16	17		1	105	50-150	11/16/2023 2120
PFBS	14	14		1	98	50-150	11/16/2023 2120
PFDS	15	14		1	89	50-150	11/16/2023 2120
PFHpS	15	15		1	98	50-150	11/16/2023 2120
PFNS	15	14		1	94	50-150	11/16/2023 2120
PFOSA	16	15		1	97	50-150	11/16/2023 2120
PFPeS	15	15		1	98	50-150	11/16/2023 2120
PFHxS	15	14		1	95	50-150	11/16/2023 2120
PFBA	16	16		1	99	50-150	11/16/2023 2120
PFDA	16	14		1	87	50-150	11/16/2023 2120
PFDoA	16	17		1	108	50-150	11/16/2023 2120
PFHpA	16	15		1	95	50-150	11/16/2023 2120
PFHxA	16	16		1	98	50-150	11/16/2023 2120
PFNA	16	15		1	96	50-150	11/16/2023 2120
PFOA	16	17		1	106	50-150	11/16/2023 2120
PFPeA	16	15		1	96	50-150	11/16/2023 2120
PFTeDA	16	16		1	101	50-150	11/16/2023 2120
PFTrDA	16	15		1	94	50-150	11/16/2023 2120
PFUdA	16	15		1	96	50-150	11/16/2023 2120
PFOS	15	14		1	96	50-150	11/16/2023 2120

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		95	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89356-002
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		87	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ31018-003MS
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	91	50-150	11/17/2023 1643
11Cl-PF3OUdS	ND	13	12		1	93	50-150	11/17/2023 1643
8:2 FTS	ND	14	13		1	98	50-150	11/17/2023 1643
6:2 FTS	ND	13	15		1	108	50-150	11/17/2023 1643
4:2 FTS	ND	13	18		1	134	50-150	11/17/2023 1643
GenX	ND	28	35		1	124	50-150	11/17/2023 1643
ADONA	ND	13	15		1	109	50-150	11/17/2023 1643
EtFOSAA	ND	14	17		1	117	50-150	11/17/2023 1643
MeFOSAA	ND	14	15		1	105	50-150	11/17/2023 1643
PFBS	ND	13	12		1	97	50-150	11/17/2023 1643
PFDS	ND	14	13		1	97	50-150	11/17/2023 1643
PFHpS	ND	14	14		1	104	50-150	11/17/2023 1643
PFNS	ND	14	14		1	102	50-150	11/17/2023 1643
PFOSA	ND	14	16		1	114	50-150	11/17/2023 1643
PFPeS	ND	13	15		1	110	50-150	11/17/2023 1643
PFHxS	ND	13	15		1	114	50-150	11/17/2023 1643
PFBA	3.4	14	18		1	102	50-150	11/17/2023 1643
PFDA	ND	14	15		1	104	50-150	11/17/2023 1643
PFDoA	0.82	14	17		1	111	50-150	11/17/2023 1643
PFHpA	1.1	14	17		1	109	50-150	11/17/2023 1643
PFHxA	6.2	14	19		1	88	50-150	11/17/2023 1643
PFNA	ND	14	16		1	115	50-150	11/17/2023 1643
PFOA	1.8	14	17		1	107	50-150	11/17/2023 1643
PFPeA	4.9	14	20		1	104	50-150	11/17/2023 1643
PFTeDA	ND	14	15		1	109	50-150	11/17/2023 1643
PFTrDA	ND	14	15		1	104	50-150	11/17/2023 1643
PFUdA	ND	14	18		1	124	50-150	11/17/2023 1643
PFOS	3.1	13	16		1	100	50-150	11/17/2023 1643

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	165	25-150
13C2_6:2FTS		136	25-150
13C2_8:2FTS		117	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		70	25-150
13C3_PFHxS		69	25-150
13C3-HFPO-DA		61	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		68	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ31018-003MS
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	25-150
13C7_PFUdA		72	25-150
13C8_PFOA		75	25-150
13C8_PFOS		65	25-150
13C8_PFOSA		67	10-150
13C9_PFNA		71	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YJ31018-003MD
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	103	12	50-150	30	11/17/2023 1654
11Cl-PF3OUdS	ND	13	13		1	96	3.1	50-150	30	11/17/2023 1654
8:2 FTS	ND	14	16		1	115	15	50-150	30	11/17/2023 1654
6:2 FTS	ND	14	16		1	115	6.8	50-150	30	11/17/2023 1654
4:2 FTS	ND	13	14		1	104	25	50-150	30	11/17/2023 1654
GenX	ND	28	30		1	105	16	50-150	30	11/17/2023 1654
ADONA	ND	13	13		1	99	9.0	50-150	30	11/17/2023 1654
EtFOSAA	ND	14	16		1	115	1.8	50-150	30	11/17/2023 1654
MeFOSAA	ND	14	16		1	110	5.2	50-150	30	11/17/2023 1654
PFBS	ND	13	13		1	100	2.8	50-150	30	11/17/2023 1654
PFDS	ND	14	14		1	100	3.4	50-150	30	11/17/2023 1654
PFHpS	ND	14	15		1	112	6.7	50-150	30	11/17/2023 1654
PFNS	ND	14	13		1	98	4.0	50-150	30	11/17/2023 1654
PFOSA	ND	14	17		1	120	5.6	50-150	30	11/17/2023 1654
PFPeS	ND	13	15		1	110	0.37	50-150	30	11/17/2023 1654
PFHxS	ND	13	14		1	110	4.1	50-150	30	11/17/2023 1654
PFBA	3.4	14	17		1	98	3.4	50-150	30	11/17/2023 1654
PFDA	ND	14	15		1	107	3.1	50-150	30	11/17/2023 1654
PFDoA	0.82	14	15		1	101	8.8	50-150	30	11/17/2023 1654
PFHpA	1.1	14	15		1	100	8.5	50-150	30	11/17/2023 1654
PFHxA	6.2	14	16		1	71	14	50-150	30	11/17/2023 1654
PFNA	ND	14	16		1	109	5.1	50-150	30	11/17/2023 1654
PFOA	1.8	14	15		1	96	9.5	50-150	30	11/17/2023 1654
PFPeA	4.9	14	19		1	96	5.8	50-150	30	11/17/2023 1654
PFTeDA	ND	14	16		1	109	0.72	50-150	30	11/17/2023 1654
PFTrDA	ND	14	14		1	95	8.2	50-150	30	11/17/2023 1654
PFUdA	ND	14	16		1	113	9.9	50-150	30	11/17/2023 1654
PFOS	3.1	13	15		1	88	9.6	50-150	30	11/17/2023 1654

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	288	25-150
13C2_6:2FTS	N	203	25-150
13C2_8:2FTS	N	151	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		123	25-150
13C5_PFPeA		106	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YJ31018-003MD
Batch: 89356
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/07/2023 1059

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		116	25-150
13C7_PFUdA		102	25-150
13C8_PFOA		123	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		107	25-150
d5-EtFOSAA		118	25-150
d3-MeFOSAA		120	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89826-001
Batch: 89826
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/13/2023 1357

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/14/2023 1318
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/14/2023 1318
8:2 FTS	ND		1	8.0	1.6	ng/L	11/14/2023 1318
6:2 FTS	ND		1	8.0	2.0	ng/L	11/14/2023 1318
4:2 FTS	ND		1	8.0	0.87	ng/L	11/14/2023 1318
GenX	ND		1	8.0	2.1	ng/L	11/14/2023 1318
ADONA	ND		1	8.0	0.48	ng/L	11/14/2023 1318
EtFOSAA	ND		1	8.0	0.75	ng/L	11/14/2023 1318
MeFOSAA	ND		1	8.0	0.93	ng/L	11/14/2023 1318
PFBS	ND		1	4.0	0.41	ng/L	11/14/2023 1318
PFDS	ND		1	4.0	0.78	ng/L	11/14/2023 1318
PFHpS	ND		1	4.0	0.50	ng/L	11/14/2023 1318
PFNS	ND		1	4.0	0.71	ng/L	11/14/2023 1318
PFOSA	ND		1	4.0	0.61	ng/L	11/14/2023 1318
PFPeS	ND		1	4.0	0.59	ng/L	11/14/2023 1318
PFHxS	ND		1	4.0	0.55	ng/L	11/14/2023 1318
PFBA	ND		1	4.0	0.60	ng/L	11/14/2023 1318
PFDA	ND		1	4.0	0.52	ng/L	11/14/2023 1318
PFDoA	ND		1	4.0	0.47	ng/L	11/14/2023 1318
PFHpA	ND		1	4.0	0.45	ng/L	11/14/2023 1318
PFHxA	ND		1	4.0	0.69	ng/L	11/14/2023 1318
PFNA	ND		1	4.0	0.46	ng/L	11/14/2023 1318
PFOA	ND		1	4.0	0.83	ng/L	11/14/2023 1318
PFPeA	ND		1	4.0	0.54	ng/L	11/14/2023 1318
PFTeDA	ND		1	4.0	0.60	ng/L	11/14/2023 1318
PFTrDA	ND		1	4.0	0.53	ng/L	11/14/2023 1318
PFUdA	ND		1	4.0	0.63	ng/L	11/14/2023 1318
PFOS	ND		1	4.0	2.0	ng/L	11/14/2023 1318

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		80	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		78	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89826-001
Batch: 89826
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/13/2023 1357

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		80	25-150
13C7_PFUdA		75	25-150
13C8_PFOA		65	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89826-002
Batch: 89826
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/13/2023 1357

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	102	50-150	11/14/2023 1328
11Cl-PF3OUdS	15	15		1	102	50-150	11/14/2023 1328
8:2 FTS	15	15		1	96	50-150	11/14/2023 1328
6:2 FTS	15	14		1	91	50-150	11/14/2023 1328
4:2 FTS	15	13		1	90	50-150	11/14/2023 1328
GenX	32	32		1	99	50-150	11/14/2023 1328
ADONA	15	16		1	104	50-150	11/14/2023 1328
EtFOSAA	16	17		1	107	50-150	11/14/2023 1328
MeFOSAA	16	18		1	113	50-150	11/14/2023 1328
PFBS	14	17		1	117	50-150	11/14/2023 1328
PFDS	15	16		1	102	50-150	11/14/2023 1328
PFHpS	15	16		1	103	50-150	11/14/2023 1328
PFNS	15	15		1	97	50-150	11/14/2023 1328
PFOSA	16	18		1	111	50-150	11/14/2023 1328
PFPeS	15	17		1	112	50-150	11/14/2023 1328
PFHxS	15	14		1	98	50-150	11/14/2023 1328
PFBA	16	18		1	115	50-150	11/14/2023 1328
PFDA	16	18		1	111	50-150	11/14/2023 1328
PFDoA	16	16		1	103	50-150	11/14/2023 1328
PFHpA	16	18		1	111	50-150	11/14/2023 1328
PFHxA	16	19		1	117	50-150	11/14/2023 1328
PFNA	16	17		1	105	50-150	11/14/2023 1328
PFOA	16	17		1	109	50-150	11/14/2023 1328
PFPeA	16	18		1	112	50-150	11/14/2023 1328
PFTeDA	16	18		1	112	50-150	11/14/2023 1328
PFTrDA	16	17		1	109	50-150	11/14/2023 1328
PFUdA	16	18		1	115	50-150	11/14/2023 1328
PFOS	15	15		1	104	50-150	11/14/2023 1328

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		89	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89826-002
Batch: 89826
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/13/2023 1357

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	25-150
13C7_PFUdA		75	25-150
13C8_PFOA		75	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90261-001
Batch: 90261
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2023 1041

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/20/2023 1726
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/20/2023 1726
8:2 FTS	ND		1	8.0	1.6	ng/L	11/20/2023 1726
6:2 FTS	ND		1	8.0	2.0	ng/L	11/20/2023 1726
4:2 FTS	ND		1	8.0	0.87	ng/L	11/20/2023 1726
GenX	ND		1	8.0	2.1	ng/L	11/20/2023 1726
ADONA	ND		1	8.0	0.48	ng/L	11/20/2023 1726
EtFOSAA	ND		1	8.0	0.75	ng/L	11/20/2023 1726
MeFOSAA	ND		1	8.0	0.93	ng/L	11/20/2023 1726
PFBS	ND		1	4.0	0.41	ng/L	11/20/2023 1726
PFDS	ND		1	4.0	0.78	ng/L	11/20/2023 1726
PFHpS	ND		1	4.0	0.50	ng/L	11/20/2023 1726
PFNS	ND		1	4.0	0.71	ng/L	11/20/2023 1726
PFOSA	ND		1	4.0	0.61	ng/L	11/20/2023 1726
PFPeS	ND		1	4.0	0.59	ng/L	11/20/2023 1726
PFHxS	ND		1	4.0	0.55	ng/L	11/20/2023 1726
PFBA	ND		1	4.0	0.60	ng/L	11/20/2023 1726
PFDA	ND		1	4.0	0.52	ng/L	11/20/2023 1726
PFDoA	ND		1	4.0	0.47	ng/L	11/20/2023 1726
PFHpA	ND		1	4.0	0.45	ng/L	11/20/2023 1726
PFHxA	ND		1	4.0	0.69	ng/L	11/20/2023 1726
PFNA	ND		1	4.0	0.46	ng/L	11/20/2023 1726
PFOA	ND		1	4.0	0.83	ng/L	11/20/2023 1726
PFPeA	ND		1	4.0	0.54	ng/L	11/20/2023 1726
PFTeDA	ND		1	4.0	0.60	ng/L	11/20/2023 1726
PFTrDA	ND		1	4.0	0.53	ng/L	11/20/2023 1726
PFUdA	ND		1	4.0	0.63	ng/L	11/20/2023 1726
PFOS	ND		1	4.0	2.0	ng/L	11/20/2023 1726

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		102	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		112	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		99	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90261-001
Batch: 90261
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2023 1041

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		103	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90261-002
Batch: 90261
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2023 1041

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	50-150	11/22/2023 0029
11Cl-PF3OUdS	15	13		1	87	50-150	11/22/2023 0029
8:2 FTS	15	15		1	100	50-150	11/22/2023 0029
6:2 FTS	15	13		1	85	50-150	11/22/2023 0029
4:2 FTS	15	15		1	101	50-150	11/22/2023 0029
GenX	32	33		1	102	50-150	11/22/2023 0029
ADONA	15	17		1	112	50-150	11/22/2023 0029
EtFOSAA	16	16		1	103	50-150	11/22/2023 0029
MeFOSAA	16	16		1	97	50-150	11/22/2023 0029
PFBS	14	15		1	105	50-150	11/22/2023 0029
PFDS	15	14		1	93	50-150	11/22/2023 0029
PFHpS	15	15		1	98	50-150	11/22/2023 0029
PFNS	15	14		1	93	50-150	11/22/2023 0029
PFOSA	16	16		1	97	50-150	11/22/2023 0029
PFPeS	15	16		1	104	50-150	11/22/2023 0029
PFHxS	15	15		1	101	50-150	11/22/2023 0029
PFBA	16	16		1	99	50-150	11/22/2023 0029
PFDA	16	17		1	103	50-150	11/22/2023 0029
PFDoA	16	17		1	105	50-150	11/22/2023 0029
PFHpA	16	16		1	100	50-150	11/22/2023 0029
PFHxA	16	17		1	105	50-150	11/22/2023 0029
PFNA	16	16		1	99	50-150	11/22/2023 0029
PFOA	16	15		1	94	50-150	11/22/2023 0029
PFPeA	16	16		1	102	50-150	11/22/2023 0029
PFTeDA	16	15		1	96	50-150	11/22/2023 0029
PFTrDA	16	13		1	83	50-150	11/22/2023 0029
PFUdA	16	15		1	91	50-150	11/22/2023 0029
PFOS	15	14		1	97	50-150	11/22/2023 0029

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		97	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90261-002
Batch: 90261
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/17/2023 1041

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		87	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		115	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90560-001
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/01/2023 2315
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/01/2023 2315
8:2 FTS	ND		1	8.0	1.6	ng/L	12/01/2023 2315
6:2 FTS	ND		1	8.0	2.0	ng/L	12/01/2023 2315
4:2 FTS	ND		1	8.0	0.87	ng/L	12/01/2023 2315
GenX	ND		1	8.0	2.1	ng/L	12/01/2023 2315
ADONA	ND		1	8.0	0.48	ng/L	12/01/2023 2315
EtFOSAA	ND		1	8.0	0.75	ng/L	12/01/2023 2315
MeFOSAA	ND		1	8.0	0.93	ng/L	12/01/2023 2315
PFBS	ND		1	4.0	0.41	ng/L	12/01/2023 2315
PFDS	ND		1	4.0	0.78	ng/L	12/01/2023 2315
PFHpS	ND		1	4.0	0.50	ng/L	12/01/2023 2315
PFNS	ND		1	4.0	0.71	ng/L	12/01/2023 2315
PFOSA	ND		1	4.0	0.61	ng/L	12/01/2023 2315
PFPeS	ND		1	4.0	0.59	ng/L	12/01/2023 2315
PFHxS	ND		1	4.0	0.55	ng/L	12/01/2023 2315
PFBA	ND		1	4.0	0.60	ng/L	12/01/2023 2315
PFDA	ND		1	4.0	0.52	ng/L	12/01/2023 2315
PFDoA	ND		1	4.0	0.47	ng/L	12/01/2023 2315
PFHpA	ND		1	4.0	0.45	ng/L	12/01/2023 2315
PFHxA	ND		1	4.0	0.69	ng/L	12/01/2023 2315
PFNA	ND		1	4.0	0.46	ng/L	12/01/2023 2315
PFOA	ND		1	4.0	0.83	ng/L	12/01/2023 2315
PFPeA	ND		1	4.0	0.54	ng/L	12/01/2023 2315
PFTeDA	ND		1	4.0	0.60	ng/L	12/01/2023 2315
PFTrDA	ND		1	4.0	0.53	ng/L	12/01/2023 2315
PFUdA	ND		1	4.0	0.63	ng/L	12/01/2023 2315
PFOS	ND		1	4.0	2.0	ng/L	12/01/2023 2315

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		105	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90560-001
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		102	25-150
13C8_PFOS		106	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90560-002
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	50-150	12/01/2023 2326
11Cl-PF3OUdS	15	15		1	99	50-150	12/01/2023 2326
8:2 FTS	15	18		1	117	50-150	12/01/2023 2326
6:2 FTS	15	18		1	119	50-150	12/01/2023 2326
4:2 FTS	15	18		1	124	50-150	12/01/2023 2326
GenX	32	38		1	118	50-150	12/01/2023 2326
ADONA	15	18		1	121	50-150	12/01/2023 2326
EtFOSAA	16	18		1	111	50-150	12/01/2023 2326
MeFOSAA	16	19		1	119	50-150	12/01/2023 2326
PFBS	14	15		1	108	50-150	12/01/2023 2326
PFDS	15	16		1	103	50-150	12/01/2023 2326
PFHpS	15	16		1	108	50-150	12/01/2023 2326
PFNS	15	15		1	99	50-150	12/01/2023 2326
PFOSA	16	17		1	109	50-150	12/01/2023 2326
PFPeS	15	16		1	109	50-150	12/01/2023 2326
PFHxS	15	17		1	119	50-150	12/01/2023 2326
PFBA	16	17		1	103	50-150	12/01/2023 2326
PFDA	16	19		1	121	50-150	12/01/2023 2326
PFDoA	16	16		1	99	50-150	12/01/2023 2326
PFHpA	16	20		1	126	50-150	12/01/2023 2326
PFHxA	16	18		1	110	50-150	12/01/2023 2326
PFNA	16	19		1	116	50-150	12/01/2023 2326
PFOA	16	17		1	106	50-150	12/01/2023 2326
PFPeA	16	18		1	113	50-150	12/01/2023 2326
PFTeDA	16	17		1	109	50-150	12/01/2023 2326
PFTrDA	16	14		1	89	50-150	12/01/2023 2326
PFUdA	16	17		1	108	50-150	12/01/2023 2326
PFOS	15	16		1	110	50-150	12/01/2023 2326

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90560-002
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	25-150
13C7_PFUdA		78	25-150
13C8_PFOA		88	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Pace Analytical Plant 2

Chain of Custody Record

Number

| | | |

Pace Analytical® Plant 2

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Accuris Cooler Inspected by/date: MRL / 10/31/23 Lot #: YJ31018

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: N/A Chlorine Strip ID: N/A Tested by: N/A
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: N/A
1.9 / 1.9 °C N/A / N/A °C N/A / N/A °C N/A / N/A °C
Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☐ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	18. Was the quote number listed on the container label? If yes, Quote # _____

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) N/A were received incorrectly preserved and were adjusted accordingly in sample receiving with N/A mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # N/A. ☐
Time of preservation N/A. If more than one preservative is needed, please note in the comments below.

Sample(s) N/A were received with bubbles >6 mm in diameter.

Samples(s) N/A were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_4$) with Unique ID: _____.

Comments:

Qualtrax ID: 56360

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YK02057**

Date Completed:12/19/2023

Project Manager:**Kathy E. Smith**

12/21/2023 7:49 AM
Approved and released by:
Project Manager II: **Edward Barnett**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YK02057

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS

Sample YK02057-022 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following sample was outside the upper control limit: YK02057-011. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: YK02057-012. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following samples was outside the upper control limit: YK02057-014, YK02057-015, YK02057-018, YK02057-019, YK02057-020, YK02057-022. The samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside control limits: YK02057-016. Re-extraction and/or re-analysis was performed outside of holding time with acceptable results. Both sets of data have been reported.

Surrogate recovery for the following sample was outside control limits: YK02057-017. Re-extraction and/or re-analysis was performed outside of holding time with concurring results. The original analysis has been reported.

Select analytes recovered outside of acceptance limits in the MS/MSD performed on sample YK02057-022. The Laboratory Control Spike (LCS) recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YK02057

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-152_102723	Aqueous	10/27/2023 1035	11/02/2023
002	DUP-16_102723	Aqueous	10/27/2023	11/02/2023
003	MW-21-136_103023	Aqueous	10/30/2023 1000	11/02/2023
004	MW-21-137_103023	Aqueous	10/30/2023 1055	11/02/2023
005	MW-21-138_103023	Aqueous	10/30/2023 1135	11/02/2023
006	MW-22-143_103023	Aqueous	10/30/2023 1340	11/02/2023
007	MW-22-158_103023	Aqueous	10/30/2023 1435	11/02/2023
008	MW-22-144_103023	Aqueous	10/30/2023 1525	11/02/2023
009	MW-22-145_103023	Aqueous	10/30/2023 1610	11/02/2023
010	DUP-15_103023	Aqueous	10/30/2023	11/02/2023
011	MW-12-10R_103023	Aqueous	10/30/2023 1730	11/02/2023
012	DUP-12_103023	Aqueous	10/30/2023	11/02/2023
013	EB-05_103023	Aqueous	10/30/2023 1750	11/02/2023
014	MW-14-66_103123	Aqueous	10/31/2023 1000	11/02/2023
015	P6-SB-18_103123	Aqueous	10/31/2023 1100	11/02/2023
016	MW-14-67_103123	Aqueous	10/31/2023 1200	11/02/2023
017	MW-13-36R_103123	Aqueous	10/31/2023 1240	11/02/2023
018	MW-14-70_103123	Aqueous	10/31/2023 1320	11/02/2023
019	MW-12-13_103123	Aqueous	10/31/2023 1400	11/02/2023
020	MW-21-133_110123	Aqueous	11/01/2023 1210	11/02/2023
021	MW-21-134_110123	Aqueous	11/01/2023 1255	11/02/2023
022	MW-21-135_110123	Aqueous	11/01/2023 1415	11/02/2023

(22 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YK02057

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-152_102723	Aqueous	PFBS	PFAS by ID	18		ng/L	9
001	MW-22-152_102723	Aqueous	PFPeS	PFAS by ID	0.64	J	ng/L	9
001	MW-22-152_102723	Aqueous	PFHxS	PFAS by ID	4.9		ng/L	9
001	MW-22-152_102723	Aqueous	PFBA	PFAS by ID	6.2		ng/L	9
001	MW-22-152_102723	Aqueous	PFHpA	PFAS by ID	1.8	J	ng/L	9
001	MW-22-152_102723	Aqueous	PFHxA	PFAS by ID	3.2	J	ng/L	9
001	MW-22-152_102723	Aqueous	PFOA	PFAS by ID	5.7		ng/L	9
001	MW-22-152_102723	Aqueous	PFPeA	PFAS by ID	4.2		ng/L	9
001	MW-22-152_102723	Aqueous	PFOS	PFAS by ID	2.9	J	ng/L	9
002	DUP-16_102723	Aqueous	PFBS	PFAS by ID	17		ng/L	11
002	DUP-16_102723	Aqueous	PFPeS	PFAS by ID	0.82	J	ng/L	11
002	DUP-16_102723	Aqueous	PFHxS	PFAS by ID	5.3		ng/L	11
002	DUP-16_102723	Aqueous	PFBA	PFAS by ID	6.0		ng/L	11
002	DUP-16_102723	Aqueous	PFHpA	PFAS by ID	2.0	J	ng/L	11
002	DUP-16_102723	Aqueous	PFHxA	PFAS by ID	3.3	J	ng/L	11
002	DUP-16_102723	Aqueous	PFOA	PFAS by ID	5.7		ng/L	11
002	DUP-16_102723	Aqueous	PFPeA	PFAS by ID	4.4		ng/L	11
002	DUP-16_102723	Aqueous	PFOS	PFAS by ID	3.1	J	ng/L	11
003	MW-21-136_103023	Aqueous	PFBS	PFAS by ID	0.96	J	ng/L	13
003	MW-21-136_103023	Aqueous	PFBA	PFAS by ID	1.9	J	ng/L	13
003	MW-21-136_103023	Aqueous	PFHxA	PFAS by ID	0.78	J	ng/L	13
003	MW-21-136_103023	Aqueous	PFPeA	PFAS by ID	0.73	J	ng/L	13
006	MW-22-143_103023	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	19
006	MW-22-143_103023	Aqueous	PFBA	PFAS by ID	10		ng/L	19
006	MW-22-143_103023	Aqueous	PFHpA	PFAS by ID	5.6		ng/L	19
006	MW-22-143_103023	Aqueous	PFHxA	PFAS by ID	13		ng/L	19
006	MW-22-143_103023	Aqueous	PFOA	PFAS by ID	5.4		ng/L	19
006	MW-22-143_103023	Aqueous	PFPeA	PFAS by ID	12		ng/L	19
007	MW-22-158_103023	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	21
007	MW-22-158_103023	Aqueous	PFBA	PFAS by ID	4.8		ng/L	21
007	MW-22-158_103023	Aqueous	PFHpA	PFAS by ID	1.3	J	ng/L	21
007	MW-22-158_103023	Aqueous	PFHxA	PFAS by ID	2.5	J	ng/L	21
007	MW-22-158_103023	Aqueous	PFOA	PFAS by ID	1.0	J	ng/L	21
007	MW-22-158_103023	Aqueous	PFPeA	PFAS by ID	2.9	J	ng/L	21
008	MW-22-144_103023	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	23
008	MW-22-144_103023	Aqueous	PFHxS	PFAS by ID	6.7		ng/L	23
008	MW-22-144_103023	Aqueous	PFBA	PFAS by ID	4.3		ng/L	23
008	MW-22-144_103023	Aqueous	PFHpA	PFAS by ID	3.5		ng/L	23
008	MW-22-144_103023	Aqueous	PFHxA	PFAS by ID	6.6		ng/L	23
008	MW-22-144_103023	Aqueous	PFOA	PFAS by ID	6.4		ng/L	23
008	MW-22-144_103023	Aqueous	PFPeA	PFAS by ID	5.7		ng/L	23
009	MW-22-145_103023	Aqueous	PFBS	PFAS by ID	2.5	J	ng/L	25
009	MW-22-145_103023	Aqueous	PFHxS	PFAS by ID	4.6		ng/L	25

Detection Summary (Continued)

Lot Number: YK02057

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
009	MW-22-145_103023	Aqueous	PFBA	PFAS by ID	6.5		ng/L	25
009	MW-22-145_103023	Aqueous	PFHpA	PFAS by ID	8.5		ng/L	25
009	MW-22-145_103023	Aqueous	PFHxA	PFAS by ID	16		ng/L	25
009	MW-22-145_103023	Aqueous	PFOA	PFAS by ID	19		ng/L	25
009	MW-22-145_103023	Aqueous	PFPeA	PFAS by ID	14		ng/L	25
010	DUP-15_103023	Aqueous	PFBS	PFAS by ID	2.5	J	ng/L	27
010	DUP-15_103023	Aqueous	PFHxS	PFAS by ID	6.5		ng/L	27
010	DUP-15_103023	Aqueous	PFBA	PFAS by ID	4.3		ng/L	27
010	DUP-15_103023	Aqueous	PFHpA	PFAS by ID	3.5		ng/L	27
010	DUP-15_103023	Aqueous	PFHxA	PFAS by ID	6.6		ng/L	27
010	DUP-15_103023	Aqueous	PFOA	PFAS by ID	6.4		ng/L	27
010	DUP-15_103023	Aqueous	PFPeA	PFAS by ID	5.2		ng/L	27
011	MW-12-10R_103023	Aqueous	PFHxS	PFAS by ID	3.3	J	ng/L	29
011	MW-12-10R_103023	Aqueous	PFBA	PFAS by ID	9.9		ng/L	29
011	MW-12-10R_103023	Aqueous	PFHpA	PFAS by ID	4.6		ng/L	29
011	MW-12-10R_103023	Aqueous	PFNA	PFAS by ID	0.71	J	ng/L	29
011	MW-12-10R_103023	Aqueous	PFOA	PFAS by ID	8.6		ng/L	29
011	MW-12-10R_103023	Aqueous	PFPeA	PFAS by ID	6.1		ng/L	29
011	MW-12-10R_103023	Aqueous	PFOS	PFAS by ID	11		ng/L	29
012	DUP-12_103023	Aqueous	PFBA	PFAS by ID	9.6		ng/L	31
012	DUP-12_103023	Aqueous	PFHpA	PFAS by ID	5.1		ng/L	31
012	DUP-12_103023	Aqueous	PFNA	PFAS by ID	0.88	J	ng/L	31
012	DUP-12_103023	Aqueous	PFOA	PFAS by ID	8.3		ng/L	31
012	DUP-12_103023	Aqueous	PFOS	PFAS by ID	10		ng/L	31
014	MW-14-66_103123	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	35
014	MW-14-66_103123	Aqueous	PFHxS	PFAS by ID	3.4	J	ng/L	35
014	MW-14-66_103123	Aqueous	PFBA	PFAS by ID	34		ng/L	35
014	MW-14-66_103123	Aqueous	PFDA	PFAS by ID	7.2		ng/L	35
014	MW-14-66_103123	Aqueous	PFHpA	PFAS by ID	16		ng/L	35
014	MW-14-66_103123	Aqueous	PFHxA	PFAS by ID	32		ng/L	35
014	MW-14-66_103123	Aqueous	PFNA	PFAS by ID	8.5		ng/L	35
014	MW-14-66_103123	Aqueous	PFOA	PFAS by ID	50		ng/L	35
014	MW-14-66_103123	Aqueous	PFPeA	PFAS by ID	24		ng/L	35
014	MW-14-66_103123	Aqueous	PFOS	PFAS by ID	200		ng/L	35
015	P6-SB-18_103123	Aqueous	EtFOSAA	PFAS by ID	1.1	J	ng/L	37
015	P6-SB-18_103123	Aqueous	MeFOSAA	PFAS by ID	0.83	J	ng/L	37
015	P6-SB-18_103123	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	37
015	P6-SB-18_103123	Aqueous	PFDS	PFAS by ID	1.5	J	ng/L	37
015	P6-SB-18_103123	Aqueous	PFOSA	PFAS by ID	1.2	J	ng/L	37
015	P6-SB-18_103123	Aqueous	PFHxS	PFAS by ID	1.8	J	ng/L	37
015	P6-SB-18_103123	Aqueous	PFBA	PFAS by ID	26		ng/L	37
015	P6-SB-18_103123	Aqueous	PFDA	PFAS by ID	6.4		ng/L	37
015	P6-SB-18_103123	Aqueous	PFHpA	PFAS by ID	12		ng/L	37
015	P6-SB-18_103123	Aqueous	PFHxA	PFAS by ID	23		ng/L	37
015	P6-SB-18_103123	Aqueous	PFNA	PFAS by ID	4.2		ng/L	37
015	P6-SB-18_103123	Aqueous	PFOA	PFAS by ID	22		ng/L	37
015	P6-SB-18_103123	Aqueous	PFPeA	PFAS by ID	24		ng/L	37
015	P6-SB-18_103123	Aqueous	PFUdA	PFAS by ID	0.57	J	ng/L	37

Detection Summary (Continued)

Lot Number: YK02057

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
015	P6-SB-18_103123	Aqueous	PFOS	PFAS by ID	29		ng/L	37
016	MW-14-67_103123	Aqueous	PFDA	PFAS by ID	1.2	J	ng/L	39
016	MW-14-67_103123	Aqueous	PFHpA	PFAS by ID	37		ng/L	39
016	MW-14-67_103123	Aqueous	PFHxA	PFAS by ID	79		ng/L	39
016	MW-14-67_103123	Aqueous	PFNA	PFAS by ID	0.54	J	ng/L	39
016	MW-14-67_103123	Aqueous	PFOA	PFAS by ID	20		ng/L	39
016	MW-14-67_103123	Aqueous	PFPeA	PFAS by ID	60		ng/L	39
016	MW-14-67_103123	Aqueous	PFOS	PFAS by ID	1.7	J	ng/L	39
016	MW-14-67_103123	Aqueous	PFBA	PFAS by ID	43	H	ng/L	41
017	MW-13-36R_103123	Aqueous	EtFOSAA	PFAS by ID	6.4	J	ng/L	43
017	MW-13-36R_103123	Aqueous	MeFOSAA	PFAS by ID	3.8	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFBS	PFAS by ID	2.9	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFHpS	PFAS by ID	0.86	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFOSA	PFAS by ID	3.5		ng/L	43
017	MW-13-36R_103123	Aqueous	PFHxS	PFAS by ID	2.3	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFDA	PFAS by ID	26		ng/L	43
017	MW-13-36R_103123	Aqueous	PFDoA	PFAS by ID	0.51	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFHpA	PFAS by ID	38		ng/L	43
017	MW-13-36R_103123	Aqueous	PFHxA	PFAS by ID	43		ng/L	43
017	MW-13-36R_103123	Aqueous	PFNA	PFAS by ID	14		ng/L	43
017	MW-13-36R_103123	Aqueous	PFOA	PFAS by ID	73		ng/L	43
017	MW-13-36R_103123	Aqueous	PFPeA	PFAS by ID	35	Q	ng/L	43
017	MW-13-36R_103123	Aqueous	PFUdA	PFAS by ID	0.79	J	ng/L	43
017	MW-13-36R_103123	Aqueous	PFOS	PFAS by ID	47		ng/L	43
018	MW-14-70_103123	Aqueous	PFBS	PFAS by ID	4.6		ng/L	45
018	MW-14-70_103123	Aqueous	PFHxS	PFAS by ID	1.7	J	ng/L	45
018	MW-14-70_103123	Aqueous	PFBA	PFAS by ID	81		ng/L	45
018	MW-14-70_103123	Aqueous	PFHpA	PFAS by ID	110		ng/L	45
018	MW-14-70_103123	Aqueous	PFHxA	PFAS by ID	280		ng/L	45
018	MW-14-70_103123	Aqueous	PFOA	PFAS by ID	17		ng/L	45
018	MW-14-70_103123	Aqueous	PFPeA	PFAS by ID	270		ng/L	45
019	MW-12-13_103123	Aqueous	PFBA	PFAS by ID	27		ng/L	47
019	MW-12-13_103123	Aqueous	PFHpA	PFAS by ID	28		ng/L	47
019	MW-12-13_103123	Aqueous	PFHxA	PFAS by ID	59		ng/L	47
019	MW-12-13_103123	Aqueous	PFOA	PFAS by ID	14		ng/L	47
019	MW-12-13_103123	Aqueous	PFPeA	PFAS by ID	37		ng/L	47
020	MW-21-133_110123	Aqueous	PFBS	PFAS by ID	3.2	J	ng/L	49
020	MW-21-133_110123	Aqueous	PFHxS	PFAS by ID	4.5		ng/L	49
020	MW-21-133_110123	Aqueous	PFBA	PFAS by ID	43		ng/L	49
020	MW-21-133_110123	Aqueous	PFHpA	PFAS by ID	61		ng/L	49
020	MW-21-133_110123	Aqueous	PFHxA	PFAS by ID	68		ng/L	49
020	MW-21-133_110123	Aqueous	PFNA	PFAS by ID	3.5		ng/L	49
020	MW-21-133_110123	Aqueous	PFOA	PFAS by ID	110		ng/L	49
020	MW-21-133_110123	Aqueous	PFPeA	PFAS by ID	48		ng/L	49
020	MW-21-133_110123	Aqueous	PFOS	PFAS by ID	8.9		ng/L	49
021	MW-21-134_110123	Aqueous	PFBS	PFAS by ID	2.5	J	ng/L	51
021	MW-21-134_110123	Aqueous	PFPeS	PFAS by ID	0.71	J	ng/L	51
021	MW-21-134_110123	Aqueous	PFHxS	PFAS by ID	3.2	J	ng/L	51

Detection Summary (Continued)

Lot Number: YK02057

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
021	MW-21-134_110123	Aqueous	PFBA	PFAS by ID	15		ng/L	51
021	MW-21-134_110123	Aqueous	PFHpA	PFAS by ID	24		ng/L	51
021	MW-21-134_110123	Aqueous	PFHxA	PFAS by ID	29		ng/L	51
021	MW-21-134_110123	Aqueous	PFNA	PFAS by ID	0.98	J	ng/L	51
021	MW-21-134_110123	Aqueous	PFOA	PFAS by ID	40		ng/L	51
021	MW-21-134_110123	Aqueous	PFPeA	PFAS by ID	27		ng/L	51
021	MW-21-134_110123	Aqueous	PFOS	PFAS by ID	5.9		ng/L	51
022	MW-21-135_110123	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	53
022	MW-21-135_110123	Aqueous	PFPeS	PFAS by ID	1.2	J	ng/L	53
022	MW-21-135_110123	Aqueous	PFHxS	PFAS by ID	3.1	J	ng/L	53
022	MW-21-135_110123	Aqueous	PFBA	PFAS by ID	11		ng/L	53
022	MW-21-135_110123	Aqueous	PFHpA	PFAS by ID	47		ng/L	53
022	MW-21-135_110123	Aqueous	PFHxA	PFAS by ID	34		ng/L	53
022	MW-21-135_110123	Aqueous	PFNA	PFAS by ID	2.2	J	ng/L	53
022	MW-21-135_110123	Aqueous	PFOA	PFAS by ID	63	S	ng/L	53
022	MW-21-135_110123	Aqueous	PFPeA	PFAS by ID	25		ng/L	53
022	MW-21-135_110123	Aqueous	PFOS	PFAS by ID	2.8	J	ng/L	53

(156 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-001**

Description: **MW-22-152_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1035** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1405	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**18**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.64**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.2**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		79	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		60	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-001**

Description: **MW-22-152_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1035** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-002**

Description: **DUP-16_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1416	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**17**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.82**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.0**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.4**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		76	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-002**

Description: **DUP-16_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-003**

Description: **MW-21-136_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1426	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.96**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.78**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		130	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-003**

Description: **MW-21-136_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-004**

Description: **MW-21-137_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1055** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1458	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		145	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-004**

Description: **MW-21-137_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1055** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-005**

Description: **MW-21-138_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1135** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1509	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		128	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		51	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK02057-005**
Description: **MW-21-138_103023**
Matrix: **Aqueous**
Date Sampled: **10/30/2023 1135**
Project Name: **RACER Lansing GWS**
Date Received: **11/02/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-006**

Description: **MW-22-143_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1530	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.6**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.4**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		144	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		61	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-006**

Description: **MW-22-143_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-007**

Description: **MW-22-158_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1541	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.8**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.0**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		136	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-007**

Description: **MW-22-158_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-008**

Description: **MW-22-144_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1525** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1551	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.7**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.3**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		109	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		75	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-008**

Description: **MW-22-144_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1525** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-009**

Description: **MW-22-145_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1610** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1602	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.5**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		123	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		71	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-009**

Description: **MW-22-145_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1610** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-010**

Description: **DUP-15_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1623	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.6**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.2**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		70	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-010**

Description: **DUP-15_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-011**

Description: **MW-12-10R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1730** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1634	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.9**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.71**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.6**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.1**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**11**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	178	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		62	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		61	25-150
13C5_PFPeA		46	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-011**

Description: **MW-12-10R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1730** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-012**

Description: **DUP-12_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1644	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.1**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.88**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.3**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**10**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	174	25-150
13C2_6:2FTS	N	176	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		70	25-150
13C5_PFHxA		65	25-150
13C5_PFPeA		44	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-012**

Description: **DUP-12_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-013**

Description: **EB-05_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1750** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1655	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150
13C2_6:2FTS		90	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-013**

Description: **EB-05_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1750** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-014**

Description: **MW-14-66_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1748	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**34**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.2**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**32**		**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**8.5**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**50**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**24**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**200**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	164	25-150
13C2_6:2FTS		147	25-150
13C2_8:2FTS		137	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		68	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		64	25-150
13C4_PFBA		41	25-150
13C4_PFHpA		67	25-150
13C5_PFHxA		62	25-150
13C5_PFPeA		56	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-014**

Description: **MW-14-66_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		66	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		76	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-015**

Description: **P6-SB-18_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1759	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.1**	**J**	**7.1**	**0.66**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**0.83**	**J**	**7.1**	**0.83**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	**335-77-3**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.69**	**ng/L**	**1**
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**26**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**12**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**23**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**22**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**24**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.57**	**J**	**3.5**	**0.55**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**29**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	212	25-150
13C2_6:2FTS	N	197	25-150
13C2_8:2FTS		142	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		38	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		62	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-015**

Description: **P6-SB-18_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1809	ELC2	11/20/2023 1010	90414
2	SOP SPE	PFAS by ID SOP	1	12/15/2023 2030	OMNS	12/09/2023 1923	91883

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**46**	**Q**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**37**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**79**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.54**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**20**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**60**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		141	25-150	HN	174	25-150
13C2_6:2FTS		148	25-150	H	113	25-150
13C2_8:2FTS		89	25-150	H	88	25-150
13C2_PFDoA		77	25-150	H	73	25-150
13C2_PFTeDA		76	25-150	H	71	25-150
13C3_PFBS		69	25-150	H	62	25-150
13C3_PFHxS		85	25-150	H	74	25-150
13C3-HFPO-DA		57	25-150	H	73	25-150
13C4_PFBA	N	23	25-150	H	39	25-150
13C4_PFHpA		69	25-150	H	88	25-150
13C5_PFHxA		59	25-150	H	74	25-150
13C5_PFPeA		40	25-150	H	62	25-150
13C6_PFDA		79	25-150	H	82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		79	25-150	H	76	25-150
13C8_PFOA		84	25-150	H	92	25-150
13C8_PFOS		82	25-150	H	77	25-150
13C8_PFOSA		81	10-150	H	80	10-150
13C9_PFNA		87	25-150	H	86	25-150
d5-EtFOSAA		85	25-150	H	69	25-150
d3-MeFOSAA		87	25-150	H	75	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1809	ELC2	11/20/2023 1010	90414
2	SOP SPE	PFAS by ID SOP	1	12/15/2023 2030	OMNS	12/09/2023 1923	91883

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	7.0	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	7.0	0.58	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	7.0	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	7.0	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	HQ	7.0	0.76	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	7.0	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	7.0	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	7.0	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	7.0	0.81	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.6**	**HJ**	**3.5**	**0.36**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.5	0.68	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.5	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.5	0.62	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	3.5	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**43**	**H**	**3.5**	**0.52**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**33**	**H**	**3.5**	**0.39**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**77**	**H**	**3.5**	**0.60**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.61**	**HJ**	**3.5**	**0.40**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**18**	**H**	**3.5**	**0.72**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**60**	**H**	**3.5**	**0.47**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.5	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.5	1.7	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		141	25-150	HN	174	25-150
13C2_6:2FTS		148	25-150	H	113	25-150
13C2_8:2FTS		89	25-150	H	88	25-150
13C2_PFDoA		77	25-150	H	73	25-150
13C2_PFTeDA		76	25-150	H	71	25-150
13C3_PFBS		69	25-150	H	62	25-150
13C3_PFHxS		85	25-150	H	74	25-150
13C3-HFPO-DA		57	25-150	H	73	25-150
13C4_PFBA	N	23	25-150	H	39	25-150
13C4_PFHpA		69	25-150	H	88	25-150
13C5_PFHxA		59	25-150	H	74	25-150
13C5_PFPeA		40	25-150	H	62	25-150
13C6_PFDA		79	25-150	H	82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		79	25-150	H	76	25-150
13C8_PFOA		84	25-150	H	92	25-150
13C8_PFOS		82	25-150	H	77	25-150
13C8_PFOSA		81	10-150	H	80	10-150
13C9_PFNA		87	25-150	H	86	25-150
d5-EtFOSAA		85	25-150	H	69	25-150
d3-MeFOSAA		87	25-150	H	75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-017**

Description: **MW-13-36R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1240** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1820	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**6.4**	**J**	**7.1**	**0.66**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**3.8**	**J**	**7.1**	**0.82**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.86**	**J**	**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**26**		**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.51**	**J**	**3.5**	**0.42**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**38**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**43**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**14**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**73**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**35**	**Q**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.79**	**J**	**3.5**	**0.55**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**47**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	201	25-150
13C2_6:2FTS	N	208	25-150
13C2_8:2FTS	N	212	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		58	25-150
13C4_PFBA	N	2.0	25-150
13C4_PFHpA		63	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA	N	10	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-017**

Description: **MW-13-36R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1240** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-018**

Description: **MW-14-70_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1831	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**81**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**110**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**280**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**270**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	153	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		57	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-018**

Description: **MW-14-70_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-019**

Description: **MW-12-13_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1841	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**27**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**28**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**59**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**37**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	158	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		68	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		58	25-150
13C6_PFDA		68	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-019**

Description: **MW-12-13_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-020**

Description: **MW-21-133_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1852	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.5**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**43**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**61**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**68**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**110**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**48**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**8.9**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	181	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		77	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		43	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		68	25-150
13C5_PFPeA		58	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-020**

Description: **MW-21-133_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-021**

Description: **MW-21-134_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1255** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1902	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.71**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**24**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**29**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.98**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**40**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**27**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.9**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		79	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-021**

Description: **MW-21-134_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1255** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-022**

Description: **MW-21-135_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1913	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	S	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**47**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**34**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**63**	**S**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**25**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	162	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		57	25-150
13C2_PFTeDA		51	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		68	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		70	25-150
13C5_PFPeA		66	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-022**

Description: **MW-21-135_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		67	25-150
13C8_PFOSA		64	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ90388-001
Batch: 90388
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/06/2023 1230
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/06/2023 1230
8:2 FTS	ND		1	8.0	1.6	ng/L	12/06/2023 1230
6:2 FTS	ND		1	8.0	2.0	ng/L	12/06/2023 1230
4:2 FTS	ND		1	8.0	0.87	ng/L	12/06/2023 1230
GenX	ND		1	8.0	2.1	ng/L	12/06/2023 1230
ADONA	ND		1	8.0	0.48	ng/L	12/06/2023 1230
EtFOSAA	ND		1	8.0	0.75	ng/L	12/06/2023 1230
MeFOSAA	ND		1	8.0	0.93	ng/L	12/06/2023 1230
PFBS	ND		1	4.0	0.41	ng/L	12/06/2023 1230
PFDS	ND		1	4.0	0.78	ng/L	12/06/2023 1230
PFHpS	ND		1	4.0	0.50	ng/L	12/06/2023 1230
PFNS	ND		1	4.0	0.71	ng/L	12/06/2023 1230
PFOSA	ND		1	4.0	0.61	ng/L	12/06/2023 1230
PFPeS	ND		1	4.0	0.59	ng/L	12/06/2023 1230
PFHxS	ND		1	4.0	0.55	ng/L	12/06/2023 1230
PFBA	ND		1	4.0	0.60	ng/L	12/06/2023 1230
PFDA	ND		1	4.0	0.52	ng/L	12/06/2023 1230
PFDoA	ND		1	4.0	0.47	ng/L	12/06/2023 1230
PFHpA	ND		1	4.0	0.45	ng/L	12/06/2023 1230
PFHxA	ND		1	4.0	0.69	ng/L	12/06/2023 1230
PFNA	ND		1	4.0	0.46	ng/L	12/06/2023 1230
PFOA	ND		1	4.0	0.83	ng/L	12/06/2023 1230
PFPeA	ND		1	4.0	0.54	ng/L	12/06/2023 1230
PFTeDA	ND		1	4.0	0.60	ng/L	12/06/2023 1230
PFTrDA	ND		1	4.0	0.53	ng/L	12/06/2023 1230
PFUdA	ND		1	4.0	0.63	ng/L	12/06/2023 1230
PFOS	ND		1	4.0	2.0	ng/L	12/06/2023 1230

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		80	25-150
13C2_6:2FTS		77	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		78	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90388-001
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	25-150
13C7_PFUdA		82	25-150
13C8_PFOA		80	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90388-002
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	50-150	12/06/2023 1240
11Cl-PF3OUdS	15	15		1	98	50-150	12/06/2023 1240
8:2 FTS	15	15		1	100	50-150	12/06/2023 1240
6:2 FTS	15	18		1	118	50-150	12/06/2023 1240
4:2 FTS	15	16		1	108	50-150	12/06/2023 1240
GenX	32	34		1	107	50-150	12/06/2023 1240
ADONA	15	19		1	128	50-150	12/06/2023 1240
EtFOSAA	16	21		1	130	50-150	12/06/2023 1240
MeFOSAA	16	17		1	103	50-150	12/06/2023 1240
PFBS	14	15		1	109	50-150	12/06/2023 1240
PFDS	15	17		1	108	50-150	12/06/2023 1240
PFHpS	15	17		1	113	50-150	12/06/2023 1240
PFNS	15	17		1	108	50-150	12/06/2023 1240
PFOSA	16	20		1	124	50-150	12/06/2023 1240
PFPeS	15	17		1	113	50-150	12/06/2023 1240
PFHxS	15	17		1	117	50-150	12/06/2023 1240
PFBA	16	18		1	110	50-150	12/06/2023 1240
PFDA	16	19		1	119	50-150	12/06/2023 1240
PFDoA	16	19		1	119	50-150	12/06/2023 1240
PFHpA	16	19		1	119	50-150	12/06/2023 1240
PFHxA	16	19		1	119	50-150	12/06/2023 1240
PFNA	16	18		1	112	50-150	12/06/2023 1240
PFOA	16	18		1	114	50-150	12/06/2023 1240
PFPeA	16	18		1	114	50-150	12/06/2023 1240
PFTeDA	16	20		1	122	50-150	12/06/2023 1240
PFTrDA	16	17		1	108	50-150	12/06/2023 1240
PFUdA	16	18		1	111	50-150	12/06/2023 1240
PFOS	15	17		1	112	50-150	12/06/2023 1240

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		82	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		75	25-150
13C5_PFPeA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90388-002
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		80	25-150
13C7_PFUdA		80	25-150
13C8_PFOA		83	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		76	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02057-005MS
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	103	50-150	12/06/2023 1519
11Cl-PF3OUdS	ND	13	13		1	99	50-150	12/06/2023 1519
8:2 FTS	ND	13	14		1	107	50-150	12/06/2023 1519
6:2 FTS	ND	13	14		1	106	50-150	12/06/2023 1519
4:2 FTS	ND	13	15		1	112	50-150	12/06/2023 1519
GenX	ND	28	30		1	106	50-150	12/06/2023 1519
ADONA	ND	13	15		1	116	50-150	12/06/2023 1519
EtFOSAA	ND	14	16		1	115	50-150	12/06/2023 1519
MeFOSAA	ND	14	13		1	93	50-150	12/06/2023 1519
PFBS	ND	12	13		1	108	50-150	12/06/2023 1519
PFDS	ND	14	14		1	103	50-150	12/06/2023 1519
PFHpS	ND	13	15		1	113	50-150	12/06/2023 1519
PFNS	ND	13	14		1	103	50-150	12/06/2023 1519
PFOSA	ND	14	17		1	120	50-150	12/06/2023 1519
PFPeS	ND	13	14		1	108	50-150	12/06/2023 1519
PFHxS	ND	13	14		1	109	50-150	12/06/2023 1519
PFBA	ND	14	15		1	105	50-150	12/06/2023 1519
PFDA	ND	14	16		1	114	50-150	12/06/2023 1519
PFDoA	ND	14	17		1	118	50-150	12/06/2023 1519
PFHpA	ND	14	14		1	98	50-150	12/06/2023 1519
PFHxA	ND	14	15		1	108	50-150	12/06/2023 1519
PFNA	ND	14	16		1	111	50-150	12/06/2023 1519
PFOA	ND	14	16		1	113	50-150	12/06/2023 1519
PFPeA	ND	14	15		1	106	50-150	12/06/2023 1519
PFTeDA	ND	14	16		1	111	50-150	12/06/2023 1519
PFTrDA	ND	14	16		1	112	50-150	12/06/2023 1519
PFUdA	ND	14	15		1	107	50-150	12/06/2023 1519
PFOS	ND	13	13		1	97	50-150	12/06/2023 1519

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		119	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02057-005MS
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	25-150
13C7_PFUdA		78	25-150
13C8_PFOA		82	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK02057-009DU
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	12/06/2023 1612
11Cl-PF3OUdS	ND	ND		1	0.00	20	12/06/2023 1612
8:2 FTS	ND	ND		1	0.00	20	12/06/2023 1612
6:2 FTS	ND	ND		1	0.00	20	12/06/2023 1612
4:2 FTS	ND	ND		1	0.00	20	12/06/2023 1612
GenX	ND	ND		1	0.00	20	12/06/2023 1612
ADONA	ND	ND		1	0.00	20	12/06/2023 1612
EtFOSAA	ND	ND		1	0.00	20	12/06/2023 1612
MeFOSAA	ND	ND		1	0.00	20	12/06/2023 1612
PFBS	2.5	2.4	J	1	3.9	20	12/06/2023 1612
PFDS	ND	ND		1	0.00	20	12/06/2023 1612
PFHpS	ND	ND		1	0.00	20	12/06/2023 1612
PFNS	ND	ND		1	0.00	20	12/06/2023 1612
PFOSA	ND	ND		1	0.00	20	12/06/2023 1612
PFPeS	ND	ND		1	0.00	20	12/06/2023 1612
PFHxS	4.6	5.1		1	11	20	12/06/2023 1612
PFBA	6.5	6.6		1	1.5	20	12/06/2023 1612
PFDA	ND	ND		1	0.00	20	12/06/2023 1612
PFDoA	ND	ND		1	0.00	20	12/06/2023 1612
PFHpA	8.5	8.7		1	1.8	20	12/06/2023 1612
PFHxA	16	16		1	1.2	20	12/06/2023 1612
PFNA	ND	ND		1	0.00	20	12/06/2023 1612
PFOA	19	17		1	12	20	12/06/2023 1612
PFPeA	14	14		1	1.2	20	12/06/2023 1612
PFTeDA	ND	ND		1	0.00	20	12/06/2023 1612
PFTrDA	ND	ND		1	0.00	20	12/06/2023 1612
PFUdA	ND	ND		1	0.00	20	12/06/2023 1612
PFOS	ND	ND		1	0.00	20	12/06/2023 1612

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		71	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK02057-009DU
Batch: 90388
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/19/2023 1118

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	25-150
13C7_PFUdA		76	25-150
13C8_PFOA		89	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90414-001
Batch: 90414
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/06/2023 1727
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/06/2023 1727
8:2 FTS	ND		1	8.0	1.6	ng/L	12/06/2023 1727
6:2 FTS	ND		1	8.0	2.0	ng/L	12/06/2023 1727
4:2 FTS	ND		1	8.0	0.87	ng/L	12/06/2023 1727
GenX	ND		1	8.0	2.1	ng/L	12/06/2023 1727
ADONA	ND		1	8.0	0.48	ng/L	12/06/2023 1727
EtFOSAA	ND		1	8.0	0.75	ng/L	12/06/2023 1727
MeFOSAA	ND		1	8.0	0.93	ng/L	12/06/2023 1727
PFBS	ND		1	4.0	0.41	ng/L	12/06/2023 1727
PFDS	ND		1	4.0	0.78	ng/L	12/06/2023 1727
PFHpS	ND		1	4.0	0.50	ng/L	12/06/2023 1727
PFNS	ND		1	4.0	0.71	ng/L	12/06/2023 1727
PFOSA	ND		1	4.0	0.61	ng/L	12/06/2023 1727
PFPeS	ND		1	4.0	0.59	ng/L	12/06/2023 1727
PFHxS	ND		1	4.0	0.55	ng/L	12/06/2023 1727
PFBA	ND		1	4.0	0.60	ng/L	12/06/2023 1727
PFDA	ND		1	4.0	0.52	ng/L	12/06/2023 1727
PFDoA	ND		1	4.0	0.47	ng/L	12/06/2023 1727
PFHpA	ND		1	4.0	0.45	ng/L	12/06/2023 1727
PFHxA	ND		1	4.0	0.69	ng/L	12/06/2023 1727
PFNA	ND		1	4.0	0.46	ng/L	12/06/2023 1727
PFOA	ND		1	4.0	0.83	ng/L	12/06/2023 1727
PFPeA	ND		1	4.0	0.54	ng/L	12/06/2023 1727
PFTeDA	ND		1	4.0	0.60	ng/L	12/06/2023 1727
PFTrDA	ND		1	4.0	0.53	ng/L	12/06/2023 1727
PFUdA	ND		1	4.0	0.63	ng/L	12/06/2023 1727
PFOS	ND		1	4.0	2.0	ng/L	12/06/2023 1727

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	25-150
13C2_6:2FTS		82	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		78	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90414-001
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		83	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90414-002
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	50-150	12/06/2023 1737
11Cl-PF3OUdS	15	14		1	93	50-150	12/06/2023 1737
8:2 FTS	15	16		1	105	50-150	12/06/2023 1737
6:2 FTS	15	14		1	91	50-150	12/06/2023 1737
4:2 FTS	15	16		1	105	50-150	12/06/2023 1737
GenX	32	35		1	108	50-150	12/06/2023 1737
ADONA	15	16		1	107	50-150	12/06/2023 1737
EtFOSAA	16	16		1	100	50-150	12/06/2023 1737
MeFOSAA	16	17		1	104	50-150	12/06/2023 1737
PFBS	14	15		1	106	50-150	12/06/2023 1737
PFDS	15	15		1	100	50-150	12/06/2023 1737
PFHpS	15	14		1	90	50-150	12/06/2023 1737
PFNS	15	15		1	100	50-150	12/06/2023 1737
PFOSA	16	17		1	104	50-150	12/06/2023 1737
PFPeS	15	15		1	102	50-150	12/06/2023 1737
PFHxS	15	14		1	96	50-150	12/06/2023 1737
PFBA	16	16		1	101	50-150	12/06/2023 1737
PFDA	16	18		1	111	50-150	12/06/2023 1737
PFDoA	16	19		1	116	50-150	12/06/2023 1737
PFHpA	16	15		1	95	50-150	12/06/2023 1737
PFHxA	16	16		1	98	50-150	12/06/2023 1737
PFNA	16	17		1	108	50-150	12/06/2023 1737
PFOA	16	18		1	114	50-150	12/06/2023 1737
PFPeA	16	17		1	103	50-150	12/06/2023 1737
PFTeDA	16	18		1	111	50-150	12/06/2023 1737
PFTrDA	16	15		1	92	50-150	12/06/2023 1737
PFUdA	16	18		1	110	50-150	12/06/2023 1737
PFOS	15	15		1	101	50-150	12/06/2023 1737

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		85	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90414-002
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	25-150
13C7_PFUdA		78	25-150
13C8_PFOA		82	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02057-022MS
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	99	50-150	12/06/2023 1924
11Cl-PF3OUdS	ND	13	12		1	93	50-150	12/06/2023 1924
8:2 FTS	ND	13	17		1	123	50-150	12/06/2023 1924
6:2 FTS	ND	13	44	N	1	330	50-150	12/06/2023 1924
4:2 FTS	ND	13	12		1	91	50-150	12/06/2023 1924
GenX	ND	28	30		1	108	50-150	12/06/2023 1924
ADONA	ND	13	14		1	103	50-150	12/06/2023 1924
EtFOSAA	ND	14	16		1	113	50-150	12/06/2023 1924
MeFOSAA	ND	14	14		1	97	50-150	12/06/2023 1924
PFBS	1.8	12	13		1	93	50-150	12/06/2023 1924
PFDS	ND	14	13		1	93	50-150	12/06/2023 1924
PFHpS	ND	13	13		1	94	50-150	12/06/2023 1924
PFNS	ND	14	12		1	91	50-150	12/06/2023 1924
PFOSA	ND	14	15		1	108	50-150	12/06/2023 1924
PFPeS	1.2	13	14		1	98	50-150	12/06/2023 1924
PFHxS	3.1	13	17		1	105	50-150	12/06/2023 1924
PFBA	11	14	26		1	105	50-150	12/06/2023 1924
PFDA	ND	14	15		1	106	50-150	12/06/2023 1924
PFDoA	ND	14	15		1	109	50-150	12/06/2023 1924
PFHpA	47	14	61		1	96	50-150	12/06/2023 1924
PFHxA	34	14	46		1	89	50-150	12/06/2023 1924
PFNA	2.2	14	18		1	111	50-150	12/06/2023 1924
PFOA	63	14	68	N	1	37	50-150	12/06/2023 1924
PFPeA	25	14	40		1	103	50-150	12/06/2023 1924
PFTeDA	ND	14	16		1	113	50-150	12/06/2023 1924
PFTrDA	ND	14	13		1	95	50-150	12/06/2023 1924
PFUdA	ND	14	14		1	101	50-150	12/06/2023 1924
PFOS	2.8	13	15		1	93	50-150	12/06/2023 1924

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	229	25-150
13C2_6:2FTS	N	172	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		58	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02057-022MS
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	25-150
13C7_PFUdA		69	25-150
13C8_PFOA		85	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK02057-022MD
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	98	0.38	50-150	30	12/06/2023 1934
11Cl-PF3OUdS	ND	13	12		1	91	0.076	50-150	30	12/06/2023 1934
8:2 FTS	ND	14	16		1	116	4.3	50-150	30	12/06/2023 1934
6:2 FTS	ND	14	45	N	1	332	1.8	50-150	30	12/06/2023 1934
4:2 FTS	ND	13	17	+	1	126	33	50-150	30	12/06/2023 1934
GenX	ND	29	33		1	116	8.4	50-150	30	12/06/2023 1934
ADONA	ND	13	13		1	97	5.0	50-150	30	12/06/2023 1934
EtFOSAA	ND	14	17		1	122	8.8	50-150	30	12/06/2023 1934
MeFOSAA	ND	14	16		1	111	15	50-150	30	12/06/2023 1934
PFBS	1.8	13	15		1	101	8.6	50-150	30	12/06/2023 1934
PFDS	ND	14	14		1	99	7.0	50-150	30	12/06/2023 1934
PFHpS	ND	14	14		1	101	8.5	50-150	30	12/06/2023 1934
PFNS	ND	14	12		1	90	0.083	50-150	30	12/06/2023 1934
PFOSA	ND	14	15		1	103	3.8	50-150	30	12/06/2023 1934
PFPeS	1.2	13	15		1	102	4.3	50-150	30	12/06/2023 1934
PFHxS	3.1	13	16		1	101	1.5	50-150	30	12/06/2023 1934
PFBA	11	14	27		1	111	4.4	50-150	30	12/06/2023 1934
PFDA	ND	14	15		1	106	0.84	50-150	30	12/06/2023 1934
PFDoA	ND	14	16		1	114	5.4	50-150	30	12/06/2023 1934
PFHpA	47	14	64		1	118	5.3	50-150	30	12/06/2023 1934
PFHxA	34	14	46		1	89	0.33	50-150	30	12/06/2023 1934
PFNA	2.2	14	19		1	115	4.2	50-150	30	12/06/2023 1934
PFOA	63	14	77		1	99	12	50-150	30	12/06/2023 1934
PFPeA	25	14	40		1	104	0.77	50-150	30	12/06/2023 1934
PFTeDA	ND	14	16		1	113	1.3	50-150	30	12/06/2023 1934
PFTrDA	ND	14	15		1	103	9.7	50-150	30	12/06/2023 1934
PFUdA	ND	14	15		1	104	4.6	50-150	30	12/06/2023 1934
PFOS	2.8	13	16		1	98	6.0	50-150	30	12/06/2023 1934

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	174	25-150
13C2_6:2FTS	N	165	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		74	25-150
13C4_PFBA		60	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		73	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK02057-022MD
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		94	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS - MB

Sample ID: YQ91883-001
Batch: 91883
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/09/2023 1923

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/15/2023 2009
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/15/2023 2009
8:2 FTS	ND		1	8.0	1.6	ng/L	12/15/2023 2009
6:2 FTS	ND		1	8.0	2.0	ng/L	12/15/2023 2009
4:2 FTS	ND		1	8.0	0.87	ng/L	12/15/2023 2009
GenX	ND		1	8.0	2.1	ng/L	12/15/2023 2009
ADONA	ND		1	8.0	0.48	ng/L	12/15/2023 2009
EtFOSAA	ND		1	8.0	0.75	ng/L	12/15/2023 2009
MeFOSAA	ND		1	8.0	0.93	ng/L	12/15/2023 2009
PFBS	ND		1	4.0	0.41	ng/L	12/15/2023 2009
PFDS	ND		1	4.0	0.78	ng/L	12/15/2023 2009
PFHpS	ND		1	4.0	0.50	ng/L	12/15/2023 2009
PFNS	ND		1	4.0	0.71	ng/L	12/15/2023 2009
PFOSA	ND		1	4.0	0.61	ng/L	12/15/2023 2009
PFPeS	ND		1	4.0	0.59	ng/L	12/15/2023 2009
PFHxS	ND		1	4.0	0.55	ng/L	12/15/2023 2009
PFBA	ND		1	4.0	0.60	ng/L	12/15/2023 2009
PFDA	ND		1	4.0	0.52	ng/L	12/15/2023 2009
PFDoA	ND		1	4.0	0.47	ng/L	12/15/2023 2009
PFHpA	ND		1	4.0	0.45	ng/L	12/15/2023 2009
PFHxA	ND		1	4.0	0.69	ng/L	12/15/2023 2009
PFNA	ND		1	4.0	0.46	ng/L	12/15/2023 2009
PFOA	ND		1	4.0	0.83	ng/L	12/15/2023 2009
PFPeA	ND		1	4.0	0.54	ng/L	12/15/2023 2009
PFTeDA	ND		1	4.0	0.60	ng/L	12/15/2023 2009
PFTrDA	ND		1	4.0	0.53	ng/L	12/15/2023 2009
PFUdA	ND		1	4.0	0.63	ng/L	12/15/2023 2009
PFOS	ND		1	4.0	2.0	ng/L	12/15/2023 2009

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ91883-001
Batch: 91883
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/09/2023 1923

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	25-150
13C7_PFUdA		84	25-150
13C8_PFOA		89	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ91883-002
Batch: 91883
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/09/2023 1923

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	50-150	12/15/2023 2020
11Cl-PF3OUdS	15	15		1	98	50-150	12/15/2023 2020
8:2 FTS	15	18		1	115	50-150	12/15/2023 2020
6:2 FTS	15	16		1	108	50-150	12/15/2023 2020
4:2 FTS	15	16		1	106	50-150	12/15/2023 2020
GenX	32	35		1	110	50-150	12/15/2023 2020
ADONA	15	16		1	105	50-150	12/15/2023 2020
EtFOSAA	16	17		1	103	50-150	12/15/2023 2020
MeFOSAA	16	18		1	114	50-150	12/15/2023 2020
PFBS	14	15		1	103	50-150	12/15/2023 2020
PFDS	15	17		1	108	50-150	12/15/2023 2020
PFHpS	15	16		1	102	50-150	12/15/2023 2020
PFNS	15	15		1	99	50-150	12/15/2023 2020
PFOSA	16	17		1	106	50-150	12/15/2023 2020
PFPeS	15	17		1	115	50-150	12/15/2023 2020
PFHxS	15	16		1	109	50-150	12/15/2023 2020
PFBA	16	16		1	102	50-150	12/15/2023 2020
PFDA	16	16		1	99	50-150	12/15/2023 2020
PFDoA	16	18		1	113	50-150	12/15/2023 2020
PFHpA	16	16		1	100	50-150	12/15/2023 2020
PFHxA	16	18		1	110	50-150	12/15/2023 2020
PFNA	16	17		1	108	50-150	12/15/2023 2020
PFOA	16	16		1	103	50-150	12/15/2023 2020
PFPeA	16	18		1	115	50-150	12/15/2023 2020
PFTeDA	16	16		1	101	50-150	12/15/2023 2020
PFTrDA	16	16		1	101	50-150	12/15/2023 2020
PFUdA	16	16		1	100	50-150	12/15/2023 2020
PFOS	15	16		1	106	50-150	12/15/2023 2020

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	25-150
13C2_6:2FTS		93	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		70	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ91883-002
Batch: 91883
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/09/2023 1923

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		86	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical Plant 6

Chain of Custody Record

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Pace Analytical™ Plant 6

Chain of Custody Record

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Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt	Telephone No. / E-mail: (248)609-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, Suite 500	Samplers Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Novi; State: MI; Zip Code: 48377	Printed Name: Austin Westhuis		
Project Name: RACER Lansing GWS			Lot # Bar Code (lab use only): YK02057 KES2
Project Number: 60171058.0370A	P.O. No: US3460911578		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	Grab=G Composite=C	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	SE35 Kit	Field filtered	PFAS (Method 537M, EGLE 28 compounds)
MW-12-10R_103023	10/30/23	1730	G	X			2							2
DUP-12_103023	10/30/23	—	G	X			2							2
EB-05_103023	10/30/23	1750	G	X			2							2
MW-14-66_103123	10/31/23	1000	G	X			2							2
P6-SB-18_103123	10/31/23	1100	G	X			2							2
MW-14-67_103123	10/31/23	1200	G	X			2							2
MW-13-36R_103123	10/31/23	1240	G	X			2							2
MW-14-70_103123	10/31/23	1320	G	X			2							2
MW-12-13_103123	10/31/23	1400	G	X			2							2
MW-21-133_10123	11/1/23	1210	G	X			2							2

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements:

1. Relinquished by: [signature] Austin Westhuis/Arcadis	Date: 11/1/23	Time: 1530	1. Received by: FedEx	Date: 11/1/23	Time: 1530
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fedex	Date: 11/02/23	Time: 0952	4. Laboratory Received by: [signature]	Date: 11/02/23	Time: 0952

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check): ☒ Y ☐ N ☐ Ice Pack; Receipt Temp: 1.0 °C; Temp. Blank: ☒ Y / ☐ N

PACE ANALYTICAL SERVICES, LLC

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Plant 6

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt	Telephone No. / E-mail: (248)809-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 29500 Cabot Drive, Suite 500	Sampler's Signature: x	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis		Lot # Bar Code (Lab use only)
Project Name: RACER Lansing GWS			
Project Number: 30171056.0370A	P.O. No.: US3460011578		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	(G=Grab) C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS (Method 537M, EGLE 28 compounds)								
MW-21-134_110123	11/1/23	1255	G	X			2							2								
MW-21-135_110123	11/1/23	1415	G	X			6							6								MS/MSD

YK02057

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements

	Relinquished by	Date	Time	Received by	Date	Time
1	Austin Westhuis/Arcadis	11/1/23	1530	FedEx	11/1/23	1530
2						
3						
4	FedEx	11/02/23	0952		11/02/23	0952

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check) ☑ Y ☐ N ☐ Ice Pack — Receipt Temp. 1.0 °C — Temp. Blank ☑ Y / ☐ N

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: MP 11/2/23 11/2/23 Lot #: YK-020957

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☐ FedEx ☐ Other: ____

✓ Yes	☐ No		1. Were custody seals present on the cooler?
✓ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: N/A Chlorine Strip ID: N/A Tested by: N/A

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: ____

1.0 / 1.0 °C N/A / N/A °C NA / NA °C NA / NA °C

Method: ✓ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ✓ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

✓ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
✓ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
✓ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
✓ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
✓ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
✓ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
✓ Yes	☐ No		9. Were tests to be performed listed on the COC?
✓ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? ____
✓ Yes	☐ No		11. Was adequate sample volume available?
✓ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
✓ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	✓ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	✓ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	✓ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	✓ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
✓ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) N/A were received incorrectly preserved and were adjusted accordingly in sample receiving with N/A mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # N/A. ☐
Time of preservation N/A. If more than one preservative is needed, please note in the comments below.

Sample(s) N/A were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YK02059**

Date Completed:12/14/2023

12/14/2023 7:01 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YK02059

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.
Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.
Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:
CF = DF * FV / Vo
FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YK02059-002, YK02059-008, YK02059-009, YK02059-010, YK02059-014 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YK02059-004, YK02059-007, YK02059-011, YK02059-012, YK02059-013, YK02059-014, YK02059-015, YK02059-016, YK02059-018. This sample did not contain any target analytes; therefore, re-extraction was not performed.

Surrogate recovery for the following samples was outside control limits: YK02059-008, YK02059-010, YK02059-014. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

The MS/MSD associated with sample YK02059-004 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YK02059

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	EB-06_103123	Aqueous	10/31/2023 0900	11/02/2023
002	MW-22-160_103123	Aqueous	10/31/2023 0950	11/02/2023
003	MW-22-146_103123	Aqueous	10/31/2023 1100	11/02/2023
004	MW-22-147_103123	Aqueous	10/31/2023 1210	11/02/2023
005	MW-22-148_103123	Aqueous	10/31/2023 1335	11/02/2023
006	MW-22-149_103123	Aqueous	10/31/2023 1435	11/02/2023
007	MW-22-150_103123	Aqueous	10/31/2023 1550	11/02/2023
008	MW-22-151_103123	Aqueous	10/31/2023 1645	11/02/2023
009	MW-04-04R_103023	Aqueous	10/30/2023 1650	11/02/2023
010	MW-04-06R_103123	Aqueous	10/31/2023 0955	11/02/2023
011	MW-20-131_103123	Aqueous	10/31/2023 1130	11/02/2023
012	MW-04-05(6)_103123	Aqueous	10/31/2023 1230	11/02/2023
013	MW-20-132_103123	Aqueous	10/31/2023 1400	11/02/2023
014	MW-12-11_103123	Aqueous	10/31/2023 1445	11/02/2023
015	MW-12-12_110123	Aqueous	11/01/2023 1130	11/02/2023
016	P6-SB-07_110123	Aqueous	11/01/2023 1250	11/02/2023
017	DUP-14_103123	Aqueous	10/31/2023	11/02/2023
018	EB-04-103023	Aqueous	10/30/2023 1620	11/02/2023

(18 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YK02059

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	EB-06_103123	Aqueous	6:2 FTS	PFAS by ID	6.7	J	ng/L	9
002	MW-22-160_103123	Aqueous	6:2 FTS	PFAS by ID	3.2	J	ng/L	11
002	MW-22-160_103123	Aqueous	PFBA	PFAS by ID	1.3	J	ng/L	11
003	MW-22-146_103123	Aqueous	6:2 FTS	PFAS by ID	2.1	J	ng/L	13
003	MW-22-146_103123	Aqueous	PFBS	PFAS by ID	3.0	J	ng/L	13
003	MW-22-146_103123	Aqueous	PFHxS	PFAS by ID	0.92	J	ng/L	13
003	MW-22-146_103123	Aqueous	PFBA	PFAS by ID	7.7		ng/L	13
003	MW-22-146_103123	Aqueous	PFOA	PFAS by ID	3.0	J	ng/L	13
003	MW-22-146_103123	Aqueous	PFPeA	PFAS by ID	0.77	J	ng/L	13
003	MW-22-146_103123	Aqueous	PFOS	PFAS by ID	3.1	J	ng/L	13
004	MW-22-147_103123	Aqueous	6:2 FTS	PFAS by ID	2.1	JS	ng/L	15
004	MW-22-147_103123	Aqueous	PFBS	PFAS by ID	3.9		ng/L	15
004	MW-22-147_103123	Aqueous	PFHxS	PFAS by ID	2.7	J	ng/L	15
004	MW-22-147_103123	Aqueous	PFBA	PFAS by ID	7.4		ng/L	15
004	MW-22-147_103123	Aqueous	PFHpA	PFAS by ID	1.5	J	ng/L	15
004	MW-22-147_103123	Aqueous	PFOA	PFAS by ID	5.0		ng/L	15
004	MW-22-147_103123	Aqueous	PFPeA	PFAS by ID	2.6	J	ng/L	15
005	MW-22-148_103123	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	17
005	MW-22-148_103123	Aqueous	PFBA	PFAS by ID	0.84	J	ng/L	17
006	MW-22-149_103123	Aqueous	PFBS	PFAS by ID	0.91	J	ng/L	19
006	MW-22-149_103123	Aqueous	PFHxS	PFAS by ID	0.80	J	ng/L	19
006	MW-22-149_103123	Aqueous	PFBA	PFAS by ID	0.59	J	ng/L	19
006	MW-22-149_103123	Aqueous	PFNA	PFAS by ID	0.56	J	ng/L	19
006	MW-22-149_103123	Aqueous	PFOA	PFAS by ID	1.3	J	ng/L	19
007	MW-22-150_103123	Aqueous	PFBA	PFAS by ID	2.7	J	ng/L	21
007	MW-22-150_103123	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	21
008	MW-22-151_103123	Aqueous	PFBS	PFAS by ID	8.3		ng/L	23
008	MW-22-151_103123	Aqueous	PFHxS	PFAS by ID	2.5	J	ng/L	23
008	MW-22-151_103123	Aqueous	PFBA	PFAS by ID	13		ng/L	23
008	MW-22-151_103123	Aqueous	PFHpA	PFAS by ID	4.1		ng/L	23
008	MW-22-151_103123	Aqueous	PFHxA	PFAS by ID	7.6		ng/L	23
008	MW-22-151_103123	Aqueous	PFNA	PFAS by ID	0.61	J	ng/L	23
008	MW-22-151_103123	Aqueous	PFOA	PFAS by ID	8.7		ng/L	23
008	MW-22-151_103123	Aqueous	PFPeA	PFAS by ID	17		ng/L	23
008	MW-22-151_103123	Aqueous	PFOS	PFAS by ID	7.1		ng/L	23
009	MW-04-04R_103023	Aqueous	PFBA	PFAS by ID	0.85	J	ng/L	25
009	MW-04-04R_103023	Aqueous	PFPeA	PFAS by ID	0.57	J	ng/L	25
010	MW-04-06R_103123	Aqueous	PFBA	PFAS by ID	4.1		ng/L	27
010	MW-04-06R_103123	Aqueous	PFPeA	PFAS by ID	1.4	J	ng/L	27
011	MW-20-131_103123	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	29
011	MW-20-131_103123	Aqueous	PFHxS	PFAS by ID	3.5		ng/L	29
011	MW-20-131_103123	Aqueous	PFBA	PFAS by ID	21		ng/L	29
011	MW-20-131_103123	Aqueous	PFDA	PFAS by ID	0.57	J	ng/L	29

Detection Summary (Continued)

Lot Number: YK02059

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
011	MW-20-131_103123	Aqueous	PFHpA	PFAS by ID	28		ng/L	29
011	MW-20-131_103123	Aqueous	PFHxA	PFAS by ID	29		ng/L	29
011	MW-20-131_103123	Aqueous	PFNA	PFAS by ID	3.2	J	ng/L	29
011	MW-20-131_103123	Aqueous	PFOA	PFAS by ID	45		ng/L	29
011	MW-20-131_103123	Aqueous	PFPeA	PFAS by ID	30		ng/L	29
011	MW-20-131_103123	Aqueous	PFOS	PFAS by ID	5.6		ng/L	29
012	MW-04-05(6)_103123	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFHxS	PFAS by ID	3.2	J	ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFBA	PFAS by ID	16		ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFHpA	PFAS by ID	27		ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFHxA	PFAS by ID	32		ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFNA	PFAS by ID	0.82	J	ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFOA	PFAS by ID	36		ng/L	31
012	MW-04-05(6)_103123	Aqueous	PFPeA	PFAS by ID	27		ng/L	31
013	MW-20-132_103123	Aqueous	PFBS	PFAS by ID	2.6	J	ng/L	33
013	MW-20-132_103123	Aqueous	PFHxS	PFAS by ID	3.5		ng/L	33
013	MW-20-132_103123	Aqueous	PFBA	PFAS by ID	20		ng/L	33
013	MW-20-132_103123	Aqueous	PFDA	PFAS by ID	2.8	J	ng/L	33
013	MW-20-132_103123	Aqueous	PFHpA	PFAS by ID	29		ng/L	33
013	MW-20-132_103123	Aqueous	PFHxA	PFAS by ID	28		ng/L	33
013	MW-20-132_103123	Aqueous	PFNA	PFAS by ID	8.0		ng/L	33
013	MW-20-132_103123	Aqueous	PFOA	PFAS by ID	50		ng/L	33
013	MW-20-132_103123	Aqueous	PFPeA	PFAS by ID	29		ng/L	33
013	MW-20-132_103123	Aqueous	PFOS	PFAS by ID	19		ng/L	33
014	MW-12-11_103123	Aqueous	PFBA	PFAS by ID	5.7		ng/L	35
014	MW-12-11_103123	Aqueous	PFHxA	PFAS by ID	0.84	J	ng/L	35
014	MW-12-11_103123	Aqueous	PFPeA	PFAS by ID	2.1	J	ng/L	35
015	MW-12-12_110123	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	37
015	MW-12-12_110123	Aqueous	PFHxS	PFAS by ID	2.2	J	ng/L	37
015	MW-12-12_110123	Aqueous	PFBA	PFAS by ID	47		ng/L	37
015	MW-12-12_110123	Aqueous	PFDA	PFAS by ID	12		ng/L	37
015	MW-12-12_110123	Aqueous	PFHpA	PFAS by ID	47		ng/L	37
015	MW-12-12_110123	Aqueous	PFHxA	PFAS by ID	140		ng/L	37
015	MW-12-12_110123	Aqueous	PFNA	PFAS by ID	7.3		ng/L	37
015	MW-12-12_110123	Aqueous	PFOA	PFAS by ID	110		ng/L	37
015	MW-12-12_110123	Aqueous	PFPeA	PFAS by ID	73		ng/L	37
015	MW-12-12_110123	Aqueous	PFOS	PFAS by ID	36		ng/L	37
016	P6-SB-07_110123	Aqueous	PFBS	PFAS by ID	3.9		ng/L	39
016	P6-SB-07_110123	Aqueous	PFHpS	PFAS by ID	1.1	J	ng/L	39
016	P6-SB-07_110123	Aqueous	PFPeS	PFAS by ID	1.4	J	ng/L	39
016	P6-SB-07_110123	Aqueous	PFHxS	PFAS by ID	5.5		ng/L	39
016	P6-SB-07_110123	Aqueous	PFBA	PFAS by ID	300		ng/L	39
016	P6-SB-07_110123	Aqueous	PFDA	PFAS by ID	28		ng/L	39
016	P6-SB-07_110123	Aqueous	PFHpA	PFAS by ID	1000		ng/L	39
016	P6-SB-07_110123	Aqueous	PFHxA	PFAS by ID	1100		ng/L	39
016	P6-SB-07_110123	Aqueous	PFNA	PFAS by ID	140		ng/L	39
016	P6-SB-07_110123	Aqueous	PFOA	PFAS by ID	1400		ng/L	39
016	P6-SB-07_110123	Aqueous	PFPeA	PFAS by ID	970		ng/L	39

Detection Summary (Continued)

Lot Number: YK02059

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
016	P6-SB-07_110123	Aqueous	PFOS	PFAS by ID	62		ng/L	39

(92 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-001**

Description: **EB-06_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0900** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1945	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**6.7**	**J**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		75	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-001**

Description: **EB-06_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0900** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		76	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-002**

Description: **MW-22-160_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0950** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2017	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**3.2**	**J**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		109	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		61	25-150
13C2_PFTeDA		62	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-002**

Description: **MW-22-160_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0950** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		68	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-003**

Description: **MW-22-146_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2027	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**2.1**	**J**	**7.2**	**1.8**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.0**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.92**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.7**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.0**	**J**	**3.6**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.77**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		88	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		70	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-003**

Description: **MW-22-146_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		79	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-004**

Description: **MW-22-147_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2038	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**2.1**	**JS**	**6.7**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.4**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.6**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	183	25-150
13C2_6:2FTS		139	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		78	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		72	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-004**

Description: **MW-22-147_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-005**

Description: **MW-22-148_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2110	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.84**	**J**	**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-005**

Description: **MW-22-148_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-006**

Description: **MW-22-149_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2121	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.91**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.80**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.59**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.56**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-006**

Description: **MW-22-149_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-007**

Description: **MW-22-150_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2131	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	177	25-150
13C2_6:2FTS	N	168	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		36	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-007**

Description: **MW-22-150_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-008**

Description: **MW-22-151_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2142	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.6**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.7**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**17**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.1**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	25-150
13C2_6:2FTS		148	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		31	25-150
13C2_PFTeDA	N	5.0	25-150
13C3_PFBS		68	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		56	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		61	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA		45	25-150
13C6_PFDA		64	25-150
13C7_PFUdA		50	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-008**

Description: **MW-22-151_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		57	25-150
13C8_PFOSA		50	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		55	25-150
d3-MeFOSAA		63	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-009**

Description: **MW-04-04R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2153	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.85**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.57**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	25-150
13C2_6:2FTS		114	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		87	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-009**

Description: **MW-04-04R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-010**

Description: **MW-04-06R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/01/2023 2347	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	Q	3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	Q	3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA	N	23	25-150
13C2_PFTeDA	N	3.0	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		47	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-010**

Description: **MW-04-06R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		69	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		59	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-011**

Description: **MW-20-131_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/01/2023 2358	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**21**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.57**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**28**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**29**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.2**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**45**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**30**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.6**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	191	25-150
13C2_6:2FTS	N	219	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		35	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-011**

Description: **MW-20-131_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-012**

Description: **MW-04-05(6)_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1230** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0009	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**27**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**32**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.82**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**36**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**27**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	182	25-150
13C2_6:2FTS	N	225	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		38	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		57	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-012**

Description: **MW-04-05(6)_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1230** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-013**

Description: **MW-20-132_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0019	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**29**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**28**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**8.0**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**50**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**29**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**19**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	191	25-150
13C2_6:2FTS	N	231	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		66	25-150
13C4_PFBA		40	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		60	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-013**

Description: **MW-20-132_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-014**

Description: **MW-12-11_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1445** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0144	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.7**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.84**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	171	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA	N	20	25-150
13C3_PFBS		109	25-150
13C3_PFHxS		119	25-150
13C3-HFPO-DA		118	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		124	25-150
13C5_PFHxA		126	25-150
13C5_PFPeA		107	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-014**

Description: **MW-12-11_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1445** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		127	25-150
13C8_PFOS		118	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		116	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
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B = Detected in the method blank
N = Recovery is out of criteria
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E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-015**

Description: **MW-12-12_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/05/2023 1407	ELC2	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**47**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**12**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**47**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**140**		**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.3**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**110**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**73**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**36**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	173	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS	N	157	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		36	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA		53	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-015**

Description: **MW-12-12_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-016**

Description: **P6-SB-07_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0216	OMNS	11/22/2023 0850	90560
2	SOP SPE	PFAS by ID SOP	5	12/05/2023 1418	ELC2	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**300**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**28**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1000**		**17**	**1.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1100**		**17**	**2.9**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**140**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1400**		**17**	**3.5**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**970**		**17**	**2.3**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**62**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	188	25-150	N	195	25-150
13C2_6:2FTS	N	177	25-150	N	156	25-150
13C2_8:2FTS		145	25-150		95	25-150
13C2_PFDoA		91	25-150		72	25-150
13C2_PFTeDA		79	25-150		71	25-150
13C3_PFBS		98	25-150		95	25-150
13C3_PFHxS		104	25-150		85	25-150
13C3-HFPO-DA		88	25-150		94	25-150
13C4_PFBA		56	25-150		86	25-150
13C4_PFHpA		77	25-150		86	25-150
13C5_PFHxA		85	25-150		92	25-150
13C5_PFPeA		72	25-150		95	25-150
13C6_PFDA		109	25-150		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-016**

Description: **P6-SB-07_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		100	25-150		92	25-150
13C8_PFOA		99	25-150		90	25-150
13C8_PFOS		94	25-150		83	25-150
13C8_PFOSA		114	10-150		87	10-150
13C9_PFNA		103	25-150		90	25-150
d5-EtFOSAA		101	25-150		84	25-150
d3-MeFOSAA		102	25-150		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-017**

Description: **DUP-14_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2125	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		80	4.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		80	6.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		80	16	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		80	20	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		80	8.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		80	21	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		80	4.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		80	7.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		80	9.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		40	4.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		40	7.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		40	5.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		40	7.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		40	6.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		40	5.9	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		40	5.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		40	5.2	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		40	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		40	4.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		40	6.9	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		40	4.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		40	8.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		40	5.4	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		40	5.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		40	6.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		40	20	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-017**

Description: **DUP-14_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-018**

Description: **EB-04-103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2136	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS	N	151	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		76	25-150
13C3_PFBS		96	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
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Q = Surrogate failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-018**

Description: **EB-04-103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ90414-001
Batch: 90414
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/06/2023 1727
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/06/2023 1727
8:2 FTS	ND		1	8.0	1.6	ng/L	12/06/2023 1727
6:2 FTS	ND		1	8.0	2.0	ng/L	12/06/2023 1727
4:2 FTS	ND		1	8.0	0.87	ng/L	12/06/2023 1727
GenX	ND		1	8.0	2.1	ng/L	12/06/2023 1727
ADONA	ND		1	8.0	0.48	ng/L	12/06/2023 1727
EtFOSAA	ND		1	8.0	0.75	ng/L	12/06/2023 1727
MeFOSAA	ND		1	8.0	0.93	ng/L	12/06/2023 1727
PFBS	ND		1	4.0	0.41	ng/L	12/06/2023 1727
PFDS	ND		1	4.0	0.78	ng/L	12/06/2023 1727
PFHpS	ND		1	4.0	0.50	ng/L	12/06/2023 1727
PFNS	ND		1	4.0	0.71	ng/L	12/06/2023 1727
PFOSA	ND		1	4.0	0.61	ng/L	12/06/2023 1727
PFPeS	ND		1	4.0	0.59	ng/L	12/06/2023 1727
PFHxS	ND		1	4.0	0.55	ng/L	12/06/2023 1727
PFBA	ND		1	4.0	0.60	ng/L	12/06/2023 1727
PFDA	ND		1	4.0	0.52	ng/L	12/06/2023 1727
PFDoA	ND		1	4.0	0.47	ng/L	12/06/2023 1727
PFHpA	ND		1	4.0	0.45	ng/L	12/06/2023 1727
PFHxA	ND		1	4.0	0.69	ng/L	12/06/2023 1727
PFNA	ND		1	4.0	0.46	ng/L	12/06/2023 1727
PFOA	ND		1	4.0	0.83	ng/L	12/06/2023 1727
PFPeA	ND		1	4.0	0.54	ng/L	12/06/2023 1727
PFTeDA	ND		1	4.0	0.60	ng/L	12/06/2023 1727
PFTrDA	ND		1	4.0	0.53	ng/L	12/06/2023 1727
PFUdA	ND		1	4.0	0.63	ng/L	12/06/2023 1727
PFOS	ND		1	4.0	2.0	ng/L	12/06/2023 1727

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	25-150
13C2_6:2FTS		82	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		78	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90414-001
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		83	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90414-002
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	100	50-150	12/06/2023 1737
11Cl-PF3OUdS	15	14		1	93	50-150	12/06/2023 1737
8:2 FTS	15	16		1	105	50-150	12/06/2023 1737
6:2 FTS	15	14		1	91	50-150	12/06/2023 1737
4:2 FTS	15	16		1	105	50-150	12/06/2023 1737
GenX	32	35		1	108	50-150	12/06/2023 1737
ADONA	15	16		1	107	50-150	12/06/2023 1737
EtFOSAA	16	16		1	100	50-150	12/06/2023 1737
MeFOSAA	16	17		1	104	50-150	12/06/2023 1737
PFBS	14	15		1	106	50-150	12/06/2023 1737
PFDS	15	15		1	100	50-150	12/06/2023 1737
PFHpS	15	14		1	90	50-150	12/06/2023 1737
PFNS	15	15		1	100	50-150	12/06/2023 1737
PFOSA	16	17		1	104	50-150	12/06/2023 1737
PFPeS	15	15		1	102	50-150	12/06/2023 1737
PFHxS	15	14		1	96	50-150	12/06/2023 1737
PFBA	16	16		1	101	50-150	12/06/2023 1737
PFDA	16	18		1	111	50-150	12/06/2023 1737
PFDoA	16	19		1	116	50-150	12/06/2023 1737
PFHpA	16	15		1	95	50-150	12/06/2023 1737
PFHxA	16	16		1	98	50-150	12/06/2023 1737
PFNA	16	17		1	108	50-150	12/06/2023 1737
PFOA	16	18		1	114	50-150	12/06/2023 1737
PFPeA	16	17		1	103	50-150	12/06/2023 1737
PFTeDA	16	18		1	111	50-150	12/06/2023 1737
PFTrDA	16	15		1	92	50-150	12/06/2023 1737
PFUdA	16	18		1	110	50-150	12/06/2023 1737
PFOS	15	15		1	101	50-150	12/06/2023 1737

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		85	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90414-002
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	25-150
13C7_PFUdA		78	25-150
13C8_PFOA		82	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02059-004MS
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	14	11		1	81	50-150	12/06/2023 2049
11Cl-PF3OUdS	ND	14	11		1	82	50-150	12/06/2023 2049
8:2 FTS	ND	14	12		1	86	50-150	12/06/2023 2049
6:2 FTS	2.1	14	16		1	99	50-150	12/06/2023 2049
4:2 FTS	ND	14	12		1	88	50-150	12/06/2023 2049
GenX	ND	29	27		1	93	50-150	12/06/2023 2049
ADONA	ND	14	12		1	89	50-150	12/06/2023 2049
EtFOSAA	ND	15	13		1	87	50-150	12/06/2023 2049
MeFOSAA	ND	15	13		1	88	50-150	12/06/2023 2049
PFBS	3.9	13	15		1	84	50-150	12/06/2023 2049
PFDS	ND	14	11		1	82	50-150	12/06/2023 2049
PFHpS	ND	14	12		1	89	50-150	12/06/2023 2049
PFNS	ND	14	11		1	77	50-150	12/06/2023 2049
PFOSA	ND	15	12		1	85	50-150	12/06/2023 2049
PFPeS	ND	14	12		1	89	50-150	12/06/2023 2049
PFHxS	2.7	13	15		1	91	50-150	12/06/2023 2049
PFBA	7.4	15	19		1	80	50-150	12/06/2023 2049
PFDA	ND	15	12		1	80	50-150	12/06/2023 2049
PFDoA	ND	15	13		1	92	50-150	12/06/2023 2049
PFHpA	1.5	15	14		1	85	50-150	12/06/2023 2049
PFHxA	ND	15	15		1	102	50-150	12/06/2023 2049
PFNA	ND	15	12		1	83	50-150	12/06/2023 2049
PFOA	5.0	15	16		1	77	50-150	12/06/2023 2049
PFPeA	2.6	15	15		1	85	50-150	12/06/2023 2049
PFTeDA	ND	15	13		1	90	50-150	12/06/2023 2049
PFTrDA	ND	15	12		1	81	50-150	12/06/2023 2049
PFUdA	ND	15	13		1	92	50-150	12/06/2023 2049
PFOS	ND	14	14		1	102	50-150	12/06/2023 2049

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	171	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		51	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		76	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02059-004MS
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		77	25-150
13C8_PFOA		95	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK02059-004MD
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	111	24	50-150	30	12/06/2023 2059
11Cl-PF3OUdS	ND	13	15		1	116	27	50-150	30	12/06/2023 2059
8:2 FTS	ND	13	13		1	102	9.6	50-150	30	12/06/2023 2059
6:2 FTS	2.1	13	28	N,+	1	200	55	50-150	30	12/06/2023 2059
4:2 FTS	ND	13	14		1	114	19	50-150	30	12/06/2023 2059
GenX	ND	27	32		1	117	16	50-150	30	12/06/2023 2059
ADONA	ND	13	14		1	111	15	50-150	30	12/06/2023 2059
EtFOSAA	ND	14	18	+	1	135	36	50-150	30	12/06/2023 2059
MeFOSAA	ND	14	15		1	112	17	50-150	30	12/06/2023 2059
PFBS	3.9	12	16		1	105	11	50-150	30	12/06/2023 2059
PFDS	ND	13	14		1	110	22	50-150	30	12/06/2023 2059
PFHpS	ND	13	14		1	111	15	50-150	30	12/06/2023 2059
PFNS	ND	13	13		1	99	17	50-150	30	12/06/2023 2059
PFOSA	ND	14	14		1	105	13	50-150	30	12/06/2023 2059
PFPeS	ND	13	13		1	105	9.4	50-150	30	12/06/2023 2059
PFHxS	2.7	12	17		1	119	16	50-150	30	12/06/2023 2059
PFBA	7.4	14	21		1	100	9.3	50-150	30	12/06/2023 2059
PFDA	ND	14	15		1	111	25	50-150	30	12/06/2023 2059
PFDoA	ND	14	16		1	115	15	50-150	30	12/06/2023 2059
PFHpA	1.5	14	16		1	109	16	50-150	30	12/06/2023 2059
PFHxA	ND	14	17		1	126	13	50-150	30	12/06/2023 2059
PFNA	ND	14	14		1	105	15	50-150	30	12/06/2023 2059
PFOA	5.0	14	20		1	108	20	50-150	30	12/06/2023 2059
PFPeA	2.6	14	18		1	111	16	50-150	30	12/06/2023 2059
PFTeDA	ND	14	16		1	116	18	50-150	30	12/06/2023 2059
PFTrDA	ND	14	16		1	117	29	50-150	30	12/06/2023 2059
PFUdA	ND	14	15		1	111	12	50-150	30	12/06/2023 2059
PFOS	ND	13	17		1	134	20	50-150	30	12/06/2023 2059

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	164	25-150
13C2_6:2FTS		126	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		70	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK02059-004MD
Batch: 90414
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/20/2023 1010

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	25-150
13C7_PFUdA		70	25-150
13C8_PFOA		90	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		68	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90560-001
Batch: 90560
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/01/2023 2315
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/01/2023 2315
8:2 FTS	ND		1	8.0	1.6	ng/L	12/01/2023 2315
6:2 FTS	ND		1	8.0	2.0	ng/L	12/01/2023 2315
4:2 FTS	ND		1	8.0	0.87	ng/L	12/01/2023 2315
GenX	ND		1	8.0	2.1	ng/L	12/01/2023 2315
ADONA	ND		1	8.0	0.48	ng/L	12/01/2023 2315
EtFOSAA	ND		1	8.0	0.75	ng/L	12/01/2023 2315
MeFOSAA	ND		1	8.0	0.93	ng/L	12/01/2023 2315
PFBS	ND		1	4.0	0.41	ng/L	12/01/2023 2315
PFDS	ND		1	4.0	0.78	ng/L	12/01/2023 2315
PFHpS	ND		1	4.0	0.50	ng/L	12/01/2023 2315
PFNS	ND		1	4.0	0.71	ng/L	12/01/2023 2315
PFOSA	ND		1	4.0	0.61	ng/L	12/01/2023 2315
PFPeS	ND		1	4.0	0.59	ng/L	12/01/2023 2315
PFHxS	ND		1	4.0	0.55	ng/L	12/01/2023 2315
PFBA	ND		1	4.0	0.60	ng/L	12/01/2023 2315
PFDA	ND		1	4.0	0.52	ng/L	12/01/2023 2315
PFDoA	ND		1	4.0	0.47	ng/L	12/01/2023 2315
PFHpA	ND		1	4.0	0.45	ng/L	12/01/2023 2315
PFHxA	ND		1	4.0	0.69	ng/L	12/01/2023 2315
PFNA	ND		1	4.0	0.46	ng/L	12/01/2023 2315
PFOA	ND		1	4.0	0.83	ng/L	12/01/2023 2315
PFPeA	ND		1	4.0	0.54	ng/L	12/01/2023 2315
PFTeDA	ND		1	4.0	0.60	ng/L	12/01/2023 2315
PFTrDA	ND		1	4.0	0.53	ng/L	12/01/2023 2315
PFUdA	ND		1	4.0	0.63	ng/L	12/01/2023 2315
PFOS	ND		1	4.0	2.0	ng/L	12/01/2023 2315

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		91	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		105	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90560-001
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		102	25-150
13C8_PFOS		106	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90560-002
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	50-150	12/01/2023 2326
11Cl-PF3OUdS	15	15		1	99	50-150	12/01/2023 2326
8:2 FTS	15	18		1	117	50-150	12/01/2023 2326
6:2 FTS	15	18		1	119	50-150	12/01/2023 2326
4:2 FTS	15	18		1	124	50-150	12/01/2023 2326
GenX	32	38		1	118	50-150	12/01/2023 2326
ADONA	15	18		1	121	50-150	12/01/2023 2326
EtFOSAA	16	18		1	111	50-150	12/01/2023 2326
MeFOSAA	16	19		1	119	50-150	12/01/2023 2326
PFBS	14	15		1	108	50-150	12/01/2023 2326
PFDS	15	16		1	103	50-150	12/01/2023 2326
PFHpS	15	16		1	108	50-150	12/01/2023 2326
PFNS	15	15		1	99	50-150	12/01/2023 2326
PFOSA	16	17		1	109	50-150	12/01/2023 2326
PFPeS	15	16		1	109	50-150	12/01/2023 2326
PFHxS	15	17		1	119	50-150	12/01/2023 2326
PFBA	16	17		1	103	50-150	12/01/2023 2326
PFDA	16	19		1	121	50-150	12/01/2023 2326
PFDoA	16	16		1	99	50-150	12/01/2023 2326
PFHpA	16	20		1	126	50-150	12/01/2023 2326
PFHxA	16	18		1	110	50-150	12/01/2023 2326
PFNA	16	19		1	116	50-150	12/01/2023 2326
PFOA	16	17		1	106	50-150	12/01/2023 2326
PFPeA	16	18		1	113	50-150	12/01/2023 2326
PFTeDA	16	17		1	109	50-150	12/01/2023 2326
PFTrDA	16	14		1	89	50-150	12/01/2023 2326
PFUdA	16	17		1	108	50-150	12/01/2023 2326
PFOS	15	16		1	110	50-150	12/01/2023 2326

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90560-002
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	25-150
13C7_PFUdA		78	25-150
13C8_PFOA		88	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02059-014MS
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	91	50-150	12/02/2023 0155
11Cl-PF3OUdS	ND	13	9.9		1	77	50-150	12/02/2023 0155
8:2 FTS	ND	13	14		1	107	50-150	12/02/2023 0155
6:2 FTS	ND	13	11		1	87	50-150	12/02/2023 0155
4:2 FTS	ND	13	13		1	101	50-150	12/02/2023 0155
GenX	ND	27	26		1	95	50-150	12/02/2023 0155
ADONA	ND	13	12		1	96	50-150	12/02/2023 0155
EtFOSAA	ND	14	15		1	109	50-150	12/02/2023 0155
MeFOSAA	ND	14	13		1	97	50-150	12/02/2023 0155
PFBS	ND	12	12		1	102	50-150	12/02/2023 0155
PFDS	ND	13	10		1	76	50-150	12/02/2023 0155
PFHpS	ND	13	13		1	100	50-150	12/02/2023 0155
PFNS	ND	13	12		1	94	50-150	12/02/2023 0155
PFOSA	ND	14	14		1	105	50-150	12/02/2023 0155
PFPeS	ND	13	13		1	103	50-150	12/02/2023 0155
PFHxS	ND	12	13		1	104	50-150	12/02/2023 0155
PFBA	5.7	14	21		1	110	50-150	12/02/2023 0155
PFDA	ND	14	15		1	111	50-150	12/02/2023 0155
PFDoA	ND	14	14		1	100	50-150	12/02/2023 0155
PFHpA	ND	14	13		1	99	50-150	12/02/2023 0155
PFHxA	0.84	14	15		1	103	50-150	12/02/2023 0155
PFNA	ND	14	14		1	101	50-150	12/02/2023 0155
PFOA	ND	14	14		1	103	50-150	12/02/2023 0155
PFPeA	2.1	14	16		1	105	50-150	12/02/2023 0155
PFTeDA	ND	14	13		1	98	50-150	12/02/2023 0155
PFTrDA	ND	14	9.8		1	72	50-150	12/02/2023 0155
PFUdA	ND	14	16		1	115	50-150	12/02/2023 0155
PFOS	ND	13	13		1	99	50-150	12/02/2023 0155

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	182	25-150
13C2_6:2FTS		130	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		43	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		111	25-150
13C3-HFPO-DA		115	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		118	25-150
13C5_PFHxA		119	25-150
13C5_PFPeA		112	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK02059-014MS
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		102	25-150
13C7_PFUdA		93	25-150
13C8_PFOA		119	25-150
13C8_PFOS		112	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK02059-016DU
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	12/02/2023 0227
11Cl-PF3OUdS	ND	ND		1	0.00	20	12/02/2023 0227
8:2 FTS	ND	ND		1	0.00	20	12/02/2023 0227
6:2 FTS	ND	ND		1	0.00	20	12/02/2023 0227
4:2 FTS	ND	ND		1	0.00	20	12/02/2023 0227
GenX	ND	ND		1	0.00	20	12/02/2023 0227
ADONA	ND	ND		1	0.00	20	12/02/2023 0227
EtFOSAA	ND	ND		1	0.00	20	12/02/2023 0227
MeFOSAA	ND	ND		1	0.00	20	12/02/2023 0227
PFBS	3.9	4.1		1	4.0	20	12/02/2023 0227
PFDS	ND	ND		1	0.00	20	12/02/2023 0227
PFHpS	1.1	0.87	J	1	19	20	12/02/2023 0227
PFNS	ND	ND		1	0.00	20	12/02/2023 0227
PFOSA	ND	ND		1	0.00	20	12/02/2023 0227
PFPeS	1.4	1.7	J,+	1	21	20	12/02/2023 0227
PFHxS	5.5	5.7		1	2.5	20	12/02/2023 0227
PFBA	300	300		1	0.060	20	12/02/2023 0227
PFDA	28	33		1	15	20	12/02/2023 0227
PFDoA	ND	ND		1	0.00	20	12/02/2023 0227
PFHpA	990	960	E	1	3.4	20	12/02/2023 0227
PFHxA	920	980	E	1	7.0	20	12/02/2023 0227
PFNA	140	160		1	9.8	20	12/02/2023 0227
PFOA	1200	1300	E	1	2.1	20	12/02/2023 0227
PFPeA	910	890	E	1	1.7	20	12/02/2023 0227
PFTeDA	ND	ND		1	0.00	20	12/02/2023 0227
PFTrDA	ND	ND		1	0.00	20	12/02/2023 0227
PFUdA	ND	ND		1	0.00	20	12/02/2023 0227
PFOS	62	57		1	8.1	20	12/02/2023 0227

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	207	25-150
13C2_6:2FTS	N	181	25-150
13C2_8:2FTS	N	159	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		110	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		60	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		73	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK02059-016DU
Batch: 90560
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/22/2023 0850

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		104	25-150
13C7_PFUdA		95	25-150
13C8_PFOA		102	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		108	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90783-001
Batch: 90783
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/12/2023 1236
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/12/2023 1236
8:2 FTS	ND		1	8.0	1.6	ng/L	12/12/2023 1236
6:2 FTS	ND		1	8.0	2.0	ng/L	12/12/2023 1236
4:2 FTS	ND		1	8.0	0.87	ng/L	12/12/2023 1236
GenX	ND		1	8.0	2.1	ng/L	12/12/2023 1236
ADONA	ND		1	8.0	0.48	ng/L	12/12/2023 1236
EtFOSAA	ND		1	8.0	0.75	ng/L	12/12/2023 1236
MeFOSAA	ND		1	8.0	0.93	ng/L	12/12/2023 1236
PFBS	ND		1	4.0	0.41	ng/L	12/12/2023 1236
PFDS	ND		1	4.0	0.78	ng/L	12/12/2023 1236
PFHpS	ND		1	4.0	0.50	ng/L	12/12/2023 1236
PFNS	ND		1	4.0	0.71	ng/L	12/12/2023 1236
PFOSA	ND		1	4.0	0.61	ng/L	12/12/2023 1236
PFPeS	ND		1	4.0	0.59	ng/L	12/12/2023 1236
PFHxS	ND		1	4.0	0.55	ng/L	12/12/2023 1236
PFBA	ND		1	4.0	0.60	ng/L	12/12/2023 1236
PFDA	ND		1	4.0	0.52	ng/L	12/12/2023 1236
PFDoA	ND		1	4.0	0.47	ng/L	12/12/2023 1236
PFHpA	ND		1	4.0	0.45	ng/L	12/12/2023 1236
PFHxA	ND		1	4.0	0.69	ng/L	12/12/2023 1236
PFNA	ND		1	4.0	0.46	ng/L	12/12/2023 1236
PFOA	ND		1	4.0	0.83	ng/L	12/12/2023 1236
PFPeA	ND		1	4.0	0.54	ng/L	12/12/2023 1236
PFTeDA	ND		1	4.0	0.60	ng/L	12/12/2023 1236
PFTrDA	ND		1	4.0	0.53	ng/L	12/12/2023 1236
PFUdA	ND		1	4.0	0.63	ng/L	12/12/2023 1236
PFOS	ND		1	4.0	2.0	ng/L	12/12/2023 1236

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		93	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90783-001
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		90	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90783-002
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	108	50-150	12/12/2023 1247
11Cl-PF3OUdS	15	15		1	97	50-150	12/12/2023 1247
8:2 FTS	15	19		1	125	50-150	12/12/2023 1247
6:2 FTS	15	18		1	117	50-150	12/12/2023 1247
4:2 FTS	15	15		1	100	50-150	12/12/2023 1247
GenX	32	33		1	103	50-150	12/12/2023 1247
ADONA	15	18		1	120	50-150	12/12/2023 1247
EtFOSAA	16	19		1	120	50-150	12/12/2023 1247
MeFOSAA	16	17		1	105	50-150	12/12/2023 1247
PFBS	14	15		1	104	50-150	12/12/2023 1247
PFDS	15	18		1	114	50-150	12/12/2023 1247
PFHpS	15	17		1	114	50-150	12/12/2023 1247
PFNS	15	15		1	99	50-150	12/12/2023 1247
PFOSA	16	17		1	109	50-150	12/12/2023 1247
PFPeS	15	16		1	104	50-150	12/12/2023 1247
PFHxS	15	15		1	103	50-150	12/12/2023 1247
PFBA	16	17		1	109	50-150	12/12/2023 1247
PFDA	16	18		1	113	50-150	12/12/2023 1247
PFDoA	16	18		1	111	50-150	12/12/2023 1247
PFHpA	16	18		1	113	50-150	12/12/2023 1247
PFHxA	16	17		1	107	50-150	12/12/2023 1247
PFNA	16	19		1	120	50-150	12/12/2023 1247
PFOA	16	17		1	107	50-150	12/12/2023 1247
PFPeA	16	18		1	111	50-150	12/12/2023 1247
PFTeDA	16	18		1	112	50-150	12/12/2023 1247
PFTrDA	16	14		1	89	50-150	12/12/2023 1247
PFUdA	16	17		1	105	50-150	12/12/2023 1247
PFOS	15	16		1	108	50-150	12/12/2023 1247

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		87	25-150

LOQ = Limit of Quantitation
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ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90783-002
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		87	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical® Plant 6

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

Plant 6

Pace Analytical™ **Chain of Custody Record**

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: ML / 11/2/23 Lot #: YY-02069

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: N/A Chlorine Strip ID: N/A Tested by: N/A
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: N/A
1.6 / 2.6 °C / °C NA / NA °C NA / NA °C
Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: S IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☑ No	☐ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) N/A were received incorrectly preserved and were adjusted accordingly in sample receiving with N/A mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # N/A. ☐
Time of preservation N/A. If more than one preservative is needed, please note in the comments below.

Sample(s) N/A were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments: Excess; ER-CH-103023 1620

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YK07011**

Date Completed:12/21/2023
Revision Date: 12/21/2023

Project Manager:**Kathy E. Smith**

12/21/2023 12:50 PM
Approved and released by:
Project Manager II: **Edward Barnett**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YK07011

Revised report – 12/21/23
This report has been revised to correct sample ID YK07011-004 which was reported incorrectly in the initial version of the report.

All other sample results are as reported in the original PDF report. This report supersedes and replaces any prior reports issued under this lot number.

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS

Sample YK07011-002 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YK07011-008, YK07011-009. The samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Surrogate recovery for the following sample was outside the upper control limit: YK07011-014. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YK07011

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-18-93_110223	Aqueous	11/02/2023 1515	11/07/2023
002	MW-02-04(3)_110223	Aqueous	11/02/2023 1650	11/07/2023
003	MW-18-94_110323	Aqueous	11/03/2023 0955	11/07/2023
004	MW-18-101_110323	Aqueous	11/03/2023 1215	11/07/2023
005	MW-18-97_110323	Aqueous	11/03/2023 1325	11/07/2023
006	MW-23_110323	Aqueous	11/03/2023 1455	11/07/2023
007	MW-91-2R_110323	Aqueous	11/03/2023 1620	11/07/2023
008	MW-18-89_110423	Aqueous	11/04/2023 0935	11/07/2023
009	DUP-07_110423	Aqueous	11/04/2023	11/07/2023
010	DUP-09_110323	Aqueous	11/03/2023	11/07/2023
011	MW-19-111_110423	Aqueous	11/04/2023 1040	11/07/2023
012	MW-19-108_110423	Aqueous	11/04/2023 1200	11/07/2023
013	MW-18-92_110423	Aqueous	11/04/2023 1245	11/07/2023
014	MW-19-107_110423	Aqueous	11/04/2023 1335	11/07/2023

(14 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YK07011

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-18-93_110223	Aqueous	PFBS	PFAS by ID	18		ng/L	8
001	MW-18-93_110223	Aqueous	PFHpS	PFAS by ID	0.61	J	ng/L	8
001	MW-18-93_110223	Aqueous	PFPeS	PFAS by ID	0.92	J	ng/L	8
001	MW-18-93_110223	Aqueous	PFHxS	PFAS by ID	18		ng/L	8
001	MW-18-93_110223	Aqueous	PFBA	PFAS by ID	25		ng/L	8
001	MW-18-93_110223	Aqueous	PFDA	PFAS by ID	3.9		ng/L	8
001	MW-18-93_110223	Aqueous	PFHpA	PFAS by ID	21		ng/L	8
001	MW-18-93_110223	Aqueous	PFHxA	PFAS by ID	54		ng/L	8
001	MW-18-93_110223	Aqueous	PFNA	PFAS by ID	4.7		ng/L	8
001	MW-18-93_110223	Aqueous	PFOA	PFAS by ID	29		ng/L	8
001	MW-18-93_110223	Aqueous	PFPeA	PFAS by ID	70		ng/L	8
001	MW-18-93_110223	Aqueous	PFOS	PFAS by ID	38		ng/L	8
002	MW-02-04(3)_110223	Aqueous	PFBA	PFAS by ID	9.4		ng/L	10
002	MW-02-04(3)_110223	Aqueous	PFHxA	PFAS by ID	5.3		ng/L	10
002	MW-02-04(3)_110223	Aqueous	PFPeA	PFAS by ID	8.9		ng/L	10
003	MW-18-94_110323	Aqueous	PFBA	PFAS by ID	4.6		ng/L	12
003	MW-18-94_110323	Aqueous	PFPeA	PFAS by ID	0.65	J	ng/L	12
004	MW-18-101_110323	Aqueous	PFBA	PFAS by ID	4.2		ng/L	14
005	MW-18-97_110323	Aqueous	PFBA	PFAS by ID	1.5	J	ng/L	16
005	MW-18-97_110323	Aqueous	PFPeA	PFAS by ID	0.60	J	ng/L	16
006	MW-23_110323	Aqueous	PFBA	PFAS by ID	1.9	J	ng/L	18
006	MW-23_110323	Aqueous	PFOS	PFAS by ID	3.3	J	ng/L	18
007	MW-91-2R_110323	Aqueous	PFBA	PFAS by ID	6.3		ng/L	20
008	MW-18-89_110423	Aqueous	PFHxS	PFAS by ID	5.8		ng/L	22
008	MW-18-89_110423	Aqueous	PFBA	PFAS by ID	8.9		ng/L	22
008	MW-18-89_110423	Aqueous	PFHpA	PFAS by ID	4.4		ng/L	22
008	MW-18-89_110423	Aqueous	PFHxA	PFAS by ID	7.5		ng/L	22
008	MW-18-89_110423	Aqueous	PFNA	PFAS by ID	1.3	J	ng/L	22
008	MW-18-89_110423	Aqueous	PFOA	PFAS by ID	14		ng/L	22
008	MW-18-89_110423	Aqueous	PFPeA	PFAS by ID	6.7		ng/L	22
008	MW-18-89_110423	Aqueous	PFOS	PFAS by ID	170		ng/L	22
009	DUP-07_110423	Aqueous	PFBS	PFAS by ID	1.3	J	ng/L	24
009	DUP-07_110423	Aqueous	PFHpS	PFAS by ID	2.3	J	ng/L	24
009	DUP-07_110423	Aqueous	PFPeS	PFAS by ID	0.95	J	ng/L	24
009	DUP-07_110423	Aqueous	PFHxS	PFAS by ID	4.9		ng/L	24
009	DUP-07_110423	Aqueous	PFBA	PFAS by ID	7.9		ng/L	24
009	DUP-07_110423	Aqueous	PFHpA	PFAS by ID	4.2		ng/L	24
009	DUP-07_110423	Aqueous	PFHxA	PFAS by ID	6.3		ng/L	24
009	DUP-07_110423	Aqueous	PFOA	PFAS by ID	12		ng/L	24
009	DUP-07_110423	Aqueous	PFPeA	PFAS by ID	5.4		ng/L	24
009	DUP-07_110423	Aqueous	PFOS	PFAS by ID	150		ng/L	24
010	DUP-09_110323	Aqueous	PFBA	PFAS by ID	3.6		ng/L	26
011	MW-19-111_110423	Aqueous	PFBS	PFAS by ID	1.5	J	ng/L	28

Detection Summary (Continued)

Lot Number: YK07011

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
011	MW-19-111_110423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	28
011	MW-19-111_110423	Aqueous	PFBA	PFAS by ID	2.7	J	ng/L	28
011	MW-19-111_110423	Aqueous	PFOA	PFAS by ID	6.2		ng/L	28
012	MW-19-108_110423	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	30
012	MW-19-108_110423	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	30
012	MW-19-108_110423	Aqueous	PFBA	PFAS by ID	1.3	J	ng/L	30
012	MW-19-108_110423	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	30
013	MW-18-92_110423	Aqueous	PFBS	PFAS by ID	0.73	J	ng/L	32
013	MW-18-92_110423	Aqueous	PFBA	PFAS by ID	1.2	J	ng/L	32
014	MW-19-107_110423	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	34
014	MW-19-107_110423	Aqueous	PFHxS	PFAS by ID	6.6		ng/L	34
014	MW-19-107_110423	Aqueous	PFBA	PFAS by ID	2.8	J	ng/L	34
014	MW-19-107_110423	Aqueous	PFOA	PFAS by ID	2.7	J	ng/L	34
014	MW-19-107_110423	Aqueous	PFPeA	PFAS by ID	1.6	J	ng/L	34
014	MW-19-107_110423	Aqueous	PFOS	PFAS by ID	2.4	J	ng/L	34

(58 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-001**

Description: **MW-18-93_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1515** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2104	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**18**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.92**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**18**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**21**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**54**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.7**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**70**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**38**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	25-150
13C2_6:2FTS		118	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-001**

Description: **MW-18-93_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1515** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-002**

Description: **MW-02-04(3)_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2114	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.4**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.9**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		115	25-150
13C2_6:2FTS		119	25-150
13C2_8:2FTS		72	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		50	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-002**

Description: **MW-02-04(3)_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-003**

Description: **MW-18-94_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0221	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.65**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		64	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		72	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-003**

Description: **MW-18-94_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-004**

Description: **MW-18-101_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2008	ELC2	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.3	0.46	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.2**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.3	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.3	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.3	0.69	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.3	0.45	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.3	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		145	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-004**

Description: **MW-18-101_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-005**

Description: **MW-18-97_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1325** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0253	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.60**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		123	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		66	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-005**

Description: **MW-18-97_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1325** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-006**

Description: **MW-23_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1455** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0314	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		68	25-150
13C2_PFDoA		59	25-150
13C2_PFTeDA		60	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		70	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		66	25-150
13C7_PFUdA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-006**

Description: **MW-23_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1455** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		73	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		67	10-150
13C9_PFNA		67	25-150
d5-EtFOSAA		64	25-150
d3-MeFOSAA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-007**

Description: **MW-91-2R_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0325	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.3**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		130	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		71	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-007**

Description: **MW-91-2R_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-008**

Description: **MW-18-89_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 0935** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0418	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.8**		**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.4**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.5**		**3.3**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.3**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.3**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.7**		**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**170**		**3.3**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	194	25-150
13C2_6:2FTS	N	206	25-150
13C2_8:2FTS		143	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		55	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		64	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-008**

Description: **MW-18-89_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 0935** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-009**

Description: **DUP-07_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0429	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.9**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.3**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**12**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.4**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**150**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	204	25-150
13C2_6:2FTS	N	202	25-150
13C2_8:2FTS		148	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		65	25-150
13C6_PFDA		90	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-009**

Description: **DUP-07_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-010**

Description: **DUP-09_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0439	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		131	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		79	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		72	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-010**

Description: **DUP-09_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		71	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-011**

Description: **MW-19-111_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1040** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0511	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.2**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		72	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		67	25-150
13C6_PFDA		70	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-011**

Description: **MW-19-111_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1040** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		69	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-012**

Description: **MW-19-108_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0521	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		64	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-012**

Description: **MW-19-108_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		72	25-150
d5-EtFOSAA		67	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-013**

Description: **MW-18-92_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0532	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		68	25-150
13C2_PFDoA		54	25-150
13C2_PFTeDA		62	25-150
13C3_PFBS		65	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		43	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		64	25-150
13C6_PFDA		66	25-150
13C7_PFUdA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-013**

Description: **MW-18-92_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		62	10-150
13C9_PFNA		68	25-150
d5-EtFOSAA		60	25-150
d3-MeFOSAA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-014**

Description: **MW-19-107_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2039	ELC2	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.4**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	220	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-014**

Description: **MW-19-107_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ90783-001
Batch: 90783
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/12/2023 1236
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/12/2023 1236
8:2 FTS	ND		1	8.0	1.6	ng/L	12/12/2023 1236
6:2 FTS	ND		1	8.0	2.0	ng/L	12/12/2023 1236
4:2 FTS	ND		1	8.0	0.87	ng/L	12/12/2023 1236
GenX	ND		1	8.0	2.1	ng/L	12/12/2023 1236
ADONA	ND		1	8.0	0.48	ng/L	12/12/2023 1236
EtFOSAA	ND		1	8.0	0.75	ng/L	12/12/2023 1236
MeFOSAA	ND		1	8.0	0.93	ng/L	12/12/2023 1236
PFBS	ND		1	4.0	0.41	ng/L	12/12/2023 1236
PFDS	ND		1	4.0	0.78	ng/L	12/12/2023 1236
PFHpS	ND		1	4.0	0.50	ng/L	12/12/2023 1236
PFNS	ND		1	4.0	0.71	ng/L	12/12/2023 1236
PFOSA	ND		1	4.0	0.61	ng/L	12/12/2023 1236
PFPeS	ND		1	4.0	0.59	ng/L	12/12/2023 1236
PFHxS	ND		1	4.0	0.55	ng/L	12/12/2023 1236
PFBA	ND		1	4.0	0.60	ng/L	12/12/2023 1236
PFDA	ND		1	4.0	0.52	ng/L	12/12/2023 1236
PFDoA	ND		1	4.0	0.47	ng/L	12/12/2023 1236
PFHpA	ND		1	4.0	0.45	ng/L	12/12/2023 1236
PFHxA	ND		1	4.0	0.69	ng/L	12/12/2023 1236
PFNA	ND		1	4.0	0.46	ng/L	12/12/2023 1236
PFOA	ND		1	4.0	0.83	ng/L	12/12/2023 1236
PFPeA	ND		1	4.0	0.54	ng/L	12/12/2023 1236
PFTeDA	ND		1	4.0	0.60	ng/L	12/12/2023 1236
PFTrDA	ND		1	4.0	0.53	ng/L	12/12/2023 1236
PFUdA	ND		1	4.0	0.63	ng/L	12/12/2023 1236
PFOS	ND		1	4.0	2.0	ng/L	12/12/2023 1236

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		93	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90783-001
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		90	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90783-002
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	108	50-150	12/12/2023 1247
11Cl-PF3OUdS	15	15		1	97	50-150	12/12/2023 1247
8:2 FTS	15	19		1	125	50-150	12/12/2023 1247
6:2 FTS	15	18		1	117	50-150	12/12/2023 1247
4:2 FTS	15	15		1	100	50-150	12/12/2023 1247
GenX	32	33		1	103	50-150	12/12/2023 1247
ADONA	15	18		1	120	50-150	12/12/2023 1247
EtFOSAA	16	19		1	120	50-150	12/12/2023 1247
MeFOSAA	16	17		1	105	50-150	12/12/2023 1247
PFBS	14	15		1	104	50-150	12/12/2023 1247
PFDS	15	18		1	114	50-150	12/12/2023 1247
PFHpS	15	17		1	114	50-150	12/12/2023 1247
PFNS	15	15		1	99	50-150	12/12/2023 1247
PFOSA	16	17		1	109	50-150	12/12/2023 1247
PFPeS	15	16		1	104	50-150	12/12/2023 1247
PFHxS	15	15		1	103	50-150	12/12/2023 1247
PFBA	16	17		1	109	50-150	12/12/2023 1247
PFDA	16	18		1	113	50-150	12/12/2023 1247
PFDoA	16	18		1	111	50-150	12/12/2023 1247
PFHpA	16	18		1	113	50-150	12/12/2023 1247
PFHxA	16	17		1	107	50-150	12/12/2023 1247
PFNA	16	19		1	120	50-150	12/12/2023 1247
PFOA	16	17		1	107	50-150	12/12/2023 1247
PFPeA	16	18		1	111	50-150	12/12/2023 1247
PFTeDA	16	18		1	112	50-150	12/12/2023 1247
PFTrDA	16	14		1	89	50-150	12/12/2023 1247
PFUdA	16	17		1	105	50-150	12/12/2023 1247
PFOS	15	16		1	108	50-150	12/12/2023 1247

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90783-002
Batch: 90783
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1057

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		87	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90790-001
Batch: 90790
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/16/2023 0200
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/16/2023 0200
8:2 FTS	ND		1	8.0	1.6	ng/L	12/16/2023 0200
6:2 FTS	ND		1	8.0	2.0	ng/L	12/16/2023 0200
4:2 FTS	ND		1	8.0	0.87	ng/L	12/16/2023 0200
GenX	ND		1	8.0	2.1	ng/L	12/16/2023 0200
ADONA	ND		1	8.0	0.48	ng/L	12/16/2023 0200
EtFOSAA	ND		1	8.0	0.75	ng/L	12/16/2023 0200
MeFOSAA	ND		1	8.0	0.93	ng/L	12/16/2023 0200
PFBS	ND		1	4.0	0.41	ng/L	12/16/2023 0200
PFDS	ND		1	4.0	0.78	ng/L	12/16/2023 0200
PFHpS	ND		1	4.0	0.50	ng/L	12/16/2023 0200
PFNS	ND		1	4.0	0.71	ng/L	12/16/2023 0200
PFOSA	ND		1	4.0	0.61	ng/L	12/16/2023 0200
PFPeS	ND		1	4.0	0.59	ng/L	12/16/2023 0200
PFHxS	ND		1	4.0	0.55	ng/L	12/16/2023 0200
PFBA	ND		1	4.0	0.60	ng/L	12/16/2023 0200
PFDA	ND		1	4.0	0.52	ng/L	12/16/2023 0200
PFDoA	ND		1	4.0	0.47	ng/L	12/16/2023 0200
PFHpA	ND		1	4.0	0.45	ng/L	12/16/2023 0200
PFHxA	ND		1	4.0	0.69	ng/L	12/16/2023 0200
PFNA	ND		1	4.0	0.46	ng/L	12/16/2023 0200
PFOA	ND		1	4.0	0.83	ng/L	12/16/2023 0200
PFPeA	ND		1	4.0	0.54	ng/L	12/16/2023 0200
PFTeDA	ND		1	4.0	0.60	ng/L	12/16/2023 0200
PFTrDA	ND		1	4.0	0.53	ng/L	12/16/2023 0200
PFUdA	ND		1	4.0	0.63	ng/L	12/16/2023 0200
PFOS	ND		1	4.0	2.0	ng/L	12/16/2023 0200

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	25-150
13C2_6:2FTS		82	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		65	25-150
13C2_PFTeDA		56	25-150
13C3_PFBS		78	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90790-001
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		75	25-150
13C7_PFUdA		69	25-150
13C8_PFOA		74	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		69	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90790-002
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	98	50-150	12/18/2023 1957
11Cl-PF3OUdS	15	15		1	97	50-150	12/18/2023 1957
8:2 FTS	15	14		1	92	50-150	12/18/2023 1957
6:2 FTS	15	15		1	99	50-150	12/18/2023 1957
4:2 FTS	15	16		1	104	50-150	12/18/2023 1957
GenX	32	32		1	101	50-150	12/18/2023 1957
ADONA	15	17		1	112	50-150	12/18/2023 1957
EtFOSAA	16	17		1	104	50-150	12/18/2023 1957
MeFOSAA	16	15		1	97	50-150	12/18/2023 1957
PFBS	14	15		1	110	50-150	12/18/2023 1957
PFDS	15	15		1	98	50-150	12/18/2023 1957
PFHpS	15	18		1	117	50-150	12/18/2023 1957
PFNS	15	15		1	96	50-150	12/18/2023 1957
PFOSA	16	17		1	108	50-150	12/18/2023 1957
PFPeS	15	16		1	105	50-150	12/18/2023 1957
PFHxS	15	16		1	111	50-150	12/18/2023 1957
PFBA	16	17		1	104	50-150	12/18/2023 1957
PFDA	16	18		1	115	50-150	12/18/2023 1957
PFDoA	16	18		1	113	50-150	12/18/2023 1957
PFHpA	16	17		1	107	50-150	12/18/2023 1957
PFHxA	16	18		1	111	50-150	12/18/2023 1957
PFNA	16	16		1	101	50-150	12/18/2023 1957
PFOA	16	19		1	118	50-150	12/18/2023 1957
PFPeA	16	17		1	106	50-150	12/18/2023 1957
PFTeDA	16	19		1	116	50-150	12/18/2023 1957
PFTrDA	16	16		1	102	50-150	12/18/2023 1957
PFUdA	16	16		1	102	50-150	12/18/2023 1957
PFOS	15	15		1	104	50-150	12/18/2023 1957

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		98	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		94	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90790-002
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		88	25-150
13C7_PFUdA		93	25-150
13C8_PFOA		93	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07011-004MS
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	11		1	88	50-150	12/18/2023 2018
11Cl-PF3OUdS	ND	13	12		1	92	50-150	12/18/2023 2018
8:2 FTS	ND	13	13		1	97	50-150	12/18/2023 2018
6:2 FTS	ND	13	11		1	85	50-150	12/18/2023 2018
4:2 FTS	ND	13	13		1	98	50-150	12/18/2023 2018
GenX	ND	28	31		1	112	50-150	12/18/2023 2018
ADONA	ND	13	14		1	107	50-150	12/18/2023 2018
EtFOSAA	ND	14	16		1	114	50-150	12/18/2023 2018
MeFOSAA	ND	14	15		1	107	50-150	12/18/2023 2018
PFBS	ND	12	12		1	103	50-150	12/18/2023 2018
PFDS	ND	13	13		1	97	50-150	12/18/2023 2018
PFHpS	ND	13	14		1	109	50-150	12/18/2023 2018
PFNS	ND	13	14		1	104	50-150	12/18/2023 2018
PFOSA	ND	14	14		1	105	50-150	12/18/2023 2018
PFPeS	ND	13	14		1	109	50-150	12/18/2023 2018
PFHxS	ND	13	14		1	109	50-150	12/18/2023 2018
PFBA	4.2	14	18		1	103	50-150	12/18/2023 2018
PFDA	ND	14	16		1	119	50-150	12/18/2023 2018
PFDoA	ND	14	13		1	97	50-150	12/18/2023 2018
PFHpA	ND	14	13		1	97	50-150	12/18/2023 2018
PFHxA	ND	14	15		1	113	50-150	12/18/2023 2018
PFNA	ND	14	14		1	101	50-150	12/18/2023 2018
PFOA	ND	14	13		1	94	50-150	12/18/2023 2018
PFPeA	ND	14	15		1	107	50-150	12/18/2023 2018
PFTeDA	ND	14	14		1	103	50-150	12/18/2023 2018
PFTrDA	ND	14	14		1	101	50-150	12/18/2023 2018
PFUdA	ND	14	16		1	117	50-150	12/18/2023 2018
PFOS	ND	13	14		1	111	50-150	12/18/2023 2018

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	155	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		58	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07011-004MS
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	25-150
13C7_PFUdA		75	25-150
13C8_PFOA		103	25-150
13C8_PFOS		79	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK07011-005DU
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	12/16/2023 0304
11Cl-PF3OUdS	ND	ND		1	0.00	20	12/16/2023 0304
8:2 FTS	ND	ND		1	0.00	20	12/16/2023 0304
6:2 FTS	ND	ND		1	0.00	20	12/16/2023 0304
4:2 FTS	ND	ND		1	0.00	20	12/16/2023 0304
GenX	ND	ND		1	0.00	20	12/16/2023 0304
ADONA	ND	ND		1	0.00	20	12/16/2023 0304
EtFOSAA	ND	ND		1	0.00	20	12/16/2023 0304
MeFOSAA	ND	ND		1	0.00	20	12/16/2023 0304
PFBS	ND	ND		1	0.00	20	12/16/2023 0304
PFDS	ND	ND		1	0.00	20	12/16/2023 0304
PFHpS	ND	ND		1	0.00	20	12/16/2023 0304
PFNS	ND	ND		1	0.00	20	12/16/2023 0304
PFOSA	ND	ND		1	0.00	20	12/16/2023 0304
PFPeS	ND	ND		1	0.00	20	12/16/2023 0304
PFHxS	ND	ND		1	0.00	20	12/16/2023 0304
PFBA	1.5	1.5	J	1	4.5	20	12/16/2023 0304
PFDA	ND	ND		1	0.00	20	12/16/2023 0304
PFDoA	ND	ND		1	0.00	20	12/16/2023 0304
PFHpA	ND	ND		1	0.00	20	12/16/2023 0304
PFHxA	ND	ND		1	0.00	20	12/16/2023 0304
PFNA	ND	ND		1	0.00	20	12/16/2023 0304
PFOA	ND	ND		1	0.00	20	12/16/2023 0304
PFPeA	0.60	0.72	J	1	18	20	12/16/2023 0304
PFTeDA	ND	ND		1	0.00	20	12/16/2023 0304
PFTrDA	ND	ND		1	0.00	20	12/16/2023 0304
PFUdA	ND	ND		1	0.00	20	12/16/2023 0304
PFOS	ND	ND		1	0.00	20	12/16/2023 0304

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		128	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		69	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK07011-005DU
Batch: 90790
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 1050

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	25-150
13C7_PFUdA		69	25-150
13C8_PFOA		85	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		79	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		72	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90904-001
Batch: 90904
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/16/2023 0450
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/16/2023 0450
8:2 FTS	ND		1	8.0	1.6	ng/L	12/16/2023 0450
6:2 FTS	ND		1	8.0	2.0	ng/L	12/16/2023 0450
4:2 FTS	ND		1	8.0	0.87	ng/L	12/16/2023 0450
GenX	ND		1	8.0	2.1	ng/L	12/16/2023 0450
ADONA	ND		1	8.0	0.48	ng/L	12/16/2023 0450
EtFOSAA	ND		1	8.0	0.75	ng/L	12/16/2023 0450
MeFOSAA	ND		1	8.0	0.93	ng/L	12/16/2023 0450
PFBS	ND		1	4.0	0.41	ng/L	12/16/2023 0450
PFDS	ND		1	4.0	0.78	ng/L	12/16/2023 0450
PFHpS	ND		1	4.0	0.50	ng/L	12/16/2023 0450
PFNS	ND		1	4.0	0.71	ng/L	12/16/2023 0450
PFOSA	ND		1	4.0	0.61	ng/L	12/16/2023 0450
PFPeS	ND		1	4.0	0.59	ng/L	12/16/2023 0450
PFHxS	ND		1	4.0	0.55	ng/L	12/16/2023 0450
PFBA	ND		1	4.0	0.60	ng/L	12/16/2023 0450
PFDA	ND		1	4.0	0.52	ng/L	12/16/2023 0450
PFDoA	ND		1	4.0	0.47	ng/L	12/16/2023 0450
PFHpA	ND		1	4.0	0.45	ng/L	12/16/2023 0450
PFHxA	ND		1	4.0	0.69	ng/L	12/16/2023 0450
PFNA	ND		1	4.0	0.46	ng/L	12/16/2023 0450
PFOA	ND		1	4.0	0.83	ng/L	12/16/2023 0450
PFPeA	ND		1	4.0	0.54	ng/L	12/16/2023 0450
PFTeDA	ND		1	4.0	0.60	ng/L	12/16/2023 0450
PFTrDA	ND		1	4.0	0.53	ng/L	12/16/2023 0450
PFUdA	ND		1	4.0	0.63	ng/L	12/16/2023 0450
PFOS	ND		1	4.0	2.0	ng/L	12/16/2023 0450

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90904-001
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		96	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90904-002
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	106	50-150	12/18/2023 2029
11Cl-PF3OUdS	15	16		1	109	50-150	12/18/2023 2029
8:2 FTS	15	17		1	109	50-150	12/18/2023 2029
6:2 FTS	15	17		1	109	50-150	12/18/2023 2029
4:2 FTS	15	19		1	125	50-150	12/18/2023 2029
GenX	32	35		1	108	50-150	12/18/2023 2029
ADONA	15	18		1	117	50-150	12/18/2023 2029
EtFOSAA	16	19		1	119	50-150	12/18/2023 2029
MeFOSAA	16	17		1	106	50-150	12/18/2023 2029
PFBS	14	16		1	111	50-150	12/18/2023 2029
PFDS	15	17		1	111	50-150	12/18/2023 2029
PFHpS	15	15		1	101	50-150	12/18/2023 2029
PFNS	15	15		1	100	50-150	12/18/2023 2029
PFOSA	16	20		1	125	50-150	12/18/2023 2029
PFPeS	15	18		1	120	50-150	12/18/2023 2029
PFHxS	15	17		1	114	50-150	12/18/2023 2029
PFBA	16	19		1	116	50-150	12/18/2023 2029
PFDA	16	19		1	121	50-150	12/18/2023 2029
PFDoA	16	17		1	109	50-150	12/18/2023 2029
PFHpA	16	18		1	112	50-150	12/18/2023 2029
PFHxA	16	18		1	112	50-150	12/18/2023 2029
PFNA	16	17		1	109	50-150	12/18/2023 2029
PFOA	16	16		1	101	50-150	12/18/2023 2029
PFPeA	16	19		1	117	50-150	12/18/2023 2029
PFTeDA	16	18		1	113	50-150	12/18/2023 2029
PFTrDA	16	17		1	104	50-150	12/18/2023 2029
PFUdA	16	18		1	109	50-150	12/18/2023 2029
PFOS	15	18		1	122	50-150	12/18/2023 2029

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		75	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90904-002
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		69	25-150
13C7_PFUdA		71	25-150
13C8_PFOA		83	25-150
13C8_PFOS		65	25-150
13C8_PFOSA		68	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		72	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07011-014MS
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	95	50-150	12/18/2023 2050
11Cl-PF3OUdS	ND	13	12		1	89	50-150	12/18/2023 2050
8:2 FTS	ND	14	16		1	116	50-150	12/18/2023 2050
6:2 FTS	ND	14	14		1	105	50-150	12/18/2023 2050
4:2 FTS	ND	13	14		1	103	50-150	12/18/2023 2050
GenX	ND	29	28		1	98	50-150	12/18/2023 2050
ADONA	ND	13	14		1	105	50-150	12/18/2023 2050
EtFOSAA	ND	14	15		1	105	50-150	12/18/2023 2050
MeFOSAA	ND	14	14		1	100	50-150	12/18/2023 2050
PFBS	2.3	13	15		1	98	50-150	12/18/2023 2050
PFDS	ND	14	14		1	102	50-150	12/18/2023 2050
PFHpS	ND	14	14		1	100	50-150	12/18/2023 2050
PFNS	ND	14	13		1	97	50-150	12/18/2023 2050
PFOSA	ND	14	16		1	110	50-150	12/18/2023 2050
PFPeS	ND	13	16		1	123	50-150	12/18/2023 2050
PFHxS	6.6	13	20		1	102	50-150	12/18/2023 2050
PFBA	2.8	14	18		1	104	50-150	12/18/2023 2050
PFDA	ND	14	17		1	116	50-150	12/18/2023 2050
PFDoA	ND	14	14		1	96	50-150	12/18/2023 2050
PFHpA	ND	14	16		1	113	50-150	12/18/2023 2050
PFHxA	ND	14	15		1	108	50-150	12/18/2023 2050
PFNA	ND	14	14		1	97	50-150	12/18/2023 2050
PFOA	2.7	14	18		1	110	50-150	12/18/2023 2050
PFPeA	1.6	14	16		1	102	50-150	12/18/2023 2050
PFTeDA	ND	14	16		1	113	50-150	12/18/2023 2050
PFTrDA	ND	14	15		1	103	50-150	12/18/2023 2050
PFUdA	ND	14	15		1	104	50-150	12/18/2023 2050
PFOS	2.4	13	16		1	105	50-150	12/18/2023 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	165	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		56	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07011-014MS
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		73	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		94	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK07011-014MD
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	98	1.7	50-150	30	12/18/2023 2101
11Cl-PF3OUdS	ND	13	12		1	93	4.5	50-150	30	12/18/2023 2101
8:2 FTS	ND	14	13		1	95	20	50-150	30	12/18/2023 2101
6:2 FTS	ND	13	15		1	108	2.3	50-150	30	12/18/2023 2101
4:2 FTS	ND	13	13		1	101	1.8	50-150	30	12/18/2023 2101
GenX	ND	28	29		1	102	3.6	50-150	30	12/18/2023 2101
ADONA	ND	13	13		1	100	5.3	50-150	30	12/18/2023 2101
EtFOSAA	ND	14	17		1	120	13	50-150	30	12/18/2023 2101
MeFOSAA	ND	14	16		1	110	9.2	50-150	30	12/18/2023 2101
PFBS	2.3	13	16		1	109	8.3	50-150	30	12/18/2023 2101
PFDS	ND	14	13		1	97	6.2	50-150	30	12/18/2023 2101
PFHpS	ND	14	14		1	102	1.3	50-150	30	12/18/2023 2101
PFNS	ND	14	14		1	105	6.9	50-150	30	12/18/2023 2101
PFOSA	ND	14	14		1	101	8.6	50-150	30	12/18/2023 2101
PFPeS	ND	13	15		1	111	11	50-150	30	12/18/2023 2101
PFHxS	6.6	13	20		1	103	0.19	50-150	30	12/18/2023 2101
PFBA	2.8	14	18		1	107	1.7	50-150	30	12/18/2023 2101
PFDA	ND	14	16		1	109	6.5	50-150	30	12/18/2023 2101
PFDoA	ND	14	15		1	102	5.8	50-150	30	12/18/2023 2101
PFHpA	ND	14	15		1	107	6.6	50-150	30	12/18/2023 2101
PFHxA	ND	14	16		1	109	0.58	50-150	30	12/18/2023 2101
PFNA	ND	14	14		1	97	0.028	50-150	30	12/18/2023 2101
PFOA	2.7	14	17		1	98	10	50-150	30	12/18/2023 2101
PFPeA	1.6	14	16		1	103	0.88	50-150	30	12/18/2023 2101
PFTeDA	ND	14	16		1	110	2.8	50-150	30	12/18/2023 2101
PFTrDA	ND	14	17		1	120	15	50-150	30	12/18/2023 2101
PFUdA	ND	14	15		1	105	0.10	50-150	30	12/18/2023 2101
PFOS	2.4	13	16		1	101	3.1	50-150	30	12/18/2023 2101

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	201	25-150
13C2_6:2FTS		130	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YK07011-014MD
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		113	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical™ Plant 3

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number YK07011

| | | |

Pace Analytical® Plant 3

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KDRW / 11/07/2023 Lot #:

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA
2.7 / 2.7 °C NA / NA °C NA / NA °C NA / NA °C
Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☐ Yes	☑ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes. Quote # 25529

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) nfi were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments: Sample MW-19-107_110423 has 10 containers.

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing GWS

Project Number: 30171056

Lot Number:**YK07013**

Date Completed:01/23/2024

01/24/2024 11:36 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YK07013

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.
Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.
Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo
FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS

The following sample was diluted due to the nature of the sample matrix: YK07013-008. The LOQ has been elevated to reflect the dilution. Sample was diluted due to being foamy.

Surrogate recovery for the following samples was outside the upper control limit: YK07013-007, YK07013-009, YK07013-012, YK07013-013, YK07013-014. These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample YK07013-010 had surrogates recovered outside of the acceptance limits. The sample was re-extracted and re-analyzed yielding outside of holding time and all data has been reported.

Sample YK07013-015 had all surrogates recovered outside of the acceptance limits due to a prep error with the first expraction. The sample was re-extracted and re-analyzed yielding outside of holding time and all data has been reported.

Sample Summary

Arcadis U.S., Inc.

Lot Number: YK07013

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-18-102_110223	Aqueous	11/02/2023 1005	11/07/2023
002	MW-18-103_110223	Aqueous	11/02/2023 1110	11/07/2023
003	MW-18-104_110223	Aqueous	11/02/2023 1200	11/07/2023
004	MW-18-105_110223	Aqueous	11/02/2023 1315	11/07/2023
005	MW-19-114_110223	Aqueous	11/02/2023 1415	11/07/2023
006	MW-18-98_110223	Aqueous	11/02/2023 1510	11/07/2023
007	MW-18-99_110323	Aqueous	11/03/2023 1045	11/07/2023
008	MW-19-112_110323	Aqueous	11/03/2023 1145	11/07/2023
009	MW-18-88_110323	Aqueous	11/03/2023 1250	11/07/2023
010	MW-18-90_110323	Aqueous	11/03/2023 1425	11/07/2023
011	MW-18-100_110323	Aqueous	11/03/2023 1535	11/07/2023
012	MW-18-95_110323	Aqueous	11/03/2023 1630	11/07/2023
013	MW-18-91_110423	Aqueous	11/04/2023 1130	11/07/2023
014	UNK-15_110423	Aqueous	11/04/2023 1215	11/07/2023
015	CH-14-RO_110423	Aqueous	11/04/2023 1320	11/07/2023

(15 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YK07013

Project Name: RACER Lansing GWS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	MW-18-103_110223	Aqueous	PFBS	PFAS by ID	11		ng/L	11
002	MW-18-103_110223	Aqueous	PFPeS	PFAS by ID	13		ng/L	11
002	MW-18-103_110223	Aqueous	PFHxS	PFAS by ID	190		ng/L	11
002	MW-18-103_110223	Aqueous	PFBA	PFAS by ID	9.8		ng/L	11
002	MW-18-103_110223	Aqueous	PFHpA	PFAS by ID	0.95	J	ng/L	11
002	MW-18-103_110223	Aqueous	PFOA	PFAS by ID	2.1	J	ng/L	11
002	MW-18-103_110223	Aqueous	PFPeA	PFAS by ID	2.6	J	ng/L	11
002	MW-18-103_110223	Aqueous	PFOS	PFAS by ID	8.8		ng/L	11
003	MW-18-104_110223	Aqueous	PFBS	PFAS by ID	0.44	J	ng/L	13
003	MW-18-104_110223	Aqueous	PFOS	PFAS by ID	4.1		ng/L	13
004	MW-18-105_110223	Aqueous	PFBS	PFAS by ID	3.5		ng/L	15
004	MW-18-105_110223	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	15
004	MW-18-105_110223	Aqueous	PFBA	PFAS by ID	0.72	J	ng/L	15
004	MW-18-105_110223	Aqueous	PFOS	PFAS by ID	7.6		ng/L	15
005	MW-19-114_110223	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	17
005	MW-19-114_110223	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	17
005	MW-19-114_110223	Aqueous	PFBA	PFAS by ID	20		ng/L	17
005	MW-19-114_110223	Aqueous	PFOS	PFAS by ID	3.8		ng/L	17
006	MW-18-98_110223	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	19
006	MW-18-98_110223	Aqueous	PFHpS	PFAS by ID	0.84	J	ng/L	19
006	MW-18-98_110223	Aqueous	PFHxS	PFAS by ID	0.79	J	ng/L	19
006	MW-18-98_110223	Aqueous	PFBA	PFAS by ID	20		ng/L	19
006	MW-18-98_110223	Aqueous	PFHpA	PFAS by ID	3.3	J	ng/L	19
006	MW-18-98_110223	Aqueous	PFHxA	PFAS by ID	5.7		ng/L	19
006	MW-18-98_110223	Aqueous	PFNA	PFAS by ID	3.3	J	ng/L	19
006	MW-18-98_110223	Aqueous	PFOA	PFAS by ID	5.1		ng/L	19
006	MW-18-98_110223	Aqueous	PFPeA	PFAS by ID	4.3		ng/L	19
006	MW-18-98_110223	Aqueous	PFOS	PFAS by ID	180		ng/L	19
007	MW-18-99_110323	Aqueous	PFHpS	PFAS by ID	1.2	J	ng/L	21
007	MW-18-99_110323	Aqueous	PFHxS	PFAS by ID	2.2	J	ng/L	21
007	MW-18-99_110323	Aqueous	PFBA	PFAS by ID	12		ng/L	21
007	MW-18-99_110323	Aqueous	PFDA	PFAS by ID	0.99	J	ng/L	21
007	MW-18-99_110323	Aqueous	PFHpA	PFAS by ID	3.1	J	ng/L	21
007	MW-18-99_110323	Aqueous	PFHxA	PFAS by ID	4.7		ng/L	21
007	MW-18-99_110323	Aqueous	PFNA	PFAS by ID	1.4	J	ng/L	21
007	MW-18-99_110323	Aqueous	PFOA	PFAS by ID	5.0		ng/L	21
007	MW-18-99_110323	Aqueous	PFPeA	PFAS by ID	3.5		ng/L	21
007	MW-18-99_110323	Aqueous	PFOS	PFAS by ID	69		ng/L	21
009	MW-18-88_110323	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	25
009	MW-18-88_110323	Aqueous	PFHpS	PFAS by ID	3.0	J	ng/L	25
009	MW-18-88_110323	Aqueous	PFHxS	PFAS by ID	6.0		ng/L	25
009	MW-18-88_110323	Aqueous	PFBA	PFAS by ID	9.5		ng/L	25
009	MW-18-88_110323	Aqueous	PFOA	PFAS by ID	9.7		ng/L	25

Detection Summary (Continued)

Lot Number: YK07013

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
009	MW-18-88_110323	Aqueous	PFOS	PFAS by ID	320		ng/L	25
010	MW-18-90_110323	Aqueous	PFHpS	PFAS by ID	22		ng/L	27
010	MW-18-90_110323	Aqueous	PFPeS	PFAS by ID	1.8	J	ng/L	27
010	MW-18-90_110323	Aqueous	PFHxS	PFAS by ID	20		ng/L	27
010	MW-18-90_110323	Aqueous	PFBA	PFAS by ID	38	Q	ng/L	27
010	MW-18-90_110323	Aqueous	PFHpA	PFAS by ID	4.8		ng/L	27
010	MW-18-90_110323	Aqueous	PFHxA	PFAS by ID	7.5		ng/L	27
010	MW-18-90_110323	Aqueous	PFOA	PFAS by ID	17		ng/L	27
010	MW-18-90_110323	Aqueous	PFOS	PFAS by ID	1200	H	ng/L	29
011	MW-18-100_110323	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	31
011	MW-18-100_110323	Aqueous	PFPeS	PFAS by ID	0.61	J	ng/L	31
011	MW-18-100_110323	Aqueous	PFHxS	PFAS by ID	3.7		ng/L	31
011	MW-18-100_110323	Aqueous	PFBA	PFAS by ID	11		ng/L	31
011	MW-18-100_110323	Aqueous	PFHpA	PFAS by ID	2.8	J	ng/L	31
011	MW-18-100_110323	Aqueous	PFHxA	PFAS by ID	6.0		ng/L	31
011	MW-18-100_110323	Aqueous	PFOA	PFAS by ID	8.3		ng/L	31
011	MW-18-100_110323	Aqueous	PFPeA	PFAS by ID	3.8		ng/L	31
011	MW-18-100_110323	Aqueous	PFOS	PFAS by ID	4.9		ng/L	31
012	MW-18-95_110323	Aqueous	PFBS	PFAS by ID	2.4	J	ng/L	33
012	MW-18-95_110323	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	33
012	MW-18-95_110323	Aqueous	PFBA	PFAS by ID	12		ng/L	33
012	MW-18-95_110323	Aqueous	PFNA	PFAS by ID	1.5	J	ng/L	33
012	MW-18-95_110323	Aqueous	PFOA	PFAS by ID	6.4		ng/L	33
012	MW-18-95_110323	Aqueous	PFPeA	PFAS by ID	0.62	J	ng/L	33
012	MW-18-95_110323	Aqueous	PFOS	PFAS by ID	55		ng/L	33
013	MW-18-91_110423	Aqueous	PFBA	PFAS by ID	6.8		ng/L	35
013	MW-18-91_110423	Aqueous	PFHxA	PFAS by ID	2.9	J	ng/L	35
013	MW-18-91_110423	Aqueous	PFOA	PFAS by ID	6.4		ng/L	35
013	MW-18-91_110423	Aqueous	PFPeA	PFAS by ID	2.5	J	ng/L	35
013	MW-18-91_110423	Aqueous	PFOS	PFAS by ID	52		ng/L	35
014	UNK-15_110423	Aqueous	PFHpS	PFAS by ID	13		ng/L	37
014	UNK-15_110423	Aqueous	PFHxS	PFAS by ID	16		ng/L	37
014	UNK-15_110423	Aqueous	PFBA	PFAS by ID	15		ng/L	37
014	UNK-15_110423	Aqueous	PFDA	PFAS by ID	3.9		ng/L	37
014	UNK-15_110423	Aqueous	PFHpA	PFAS by ID	6.3		ng/L	37
014	UNK-15_110423	Aqueous	PFHxA	PFAS by ID	8.7		ng/L	37
014	UNK-15_110423	Aqueous	PFNA	PFAS by ID	5.2		ng/L	37
014	UNK-15_110423	Aqueous	PFOA	PFAS by ID	24		ng/L	37
014	UNK-15_110423	Aqueous	PFPeA	PFAS by ID	9.0		ng/L	37
014	UNK-15_110423	Aqueous	PFOS	PFAS by ID	1400		ng/L	37
015	CH-14-RO_110423	Aqueous	PFBS	PFAS by ID	95	HJ	ng/L	41
015	CH-14-RO_110423	Aqueous	PFHpS	PFAS by ID	330	H	ng/L	41
015	CH-14-RO_110423	Aqueous	PFPeS	PFAS by ID	310	H	ng/L	41
015	CH-14-RO_110423	Aqueous	PFHxS	PFAS by ID	1400	H	ng/L	41
015	CH-14-RO_110423	Aqueous	PFHxA	PFAS by ID	40	HJ	ng/L	41
015	CH-14-RO_110423	Aqueous	PFOA	PFAS by ID	100	HJ	ng/L	41
015	CH-14-RO_110423	Aqueous	PFOS	PFAS by ID	9800	H	ng/L	41

Detection Summary (Continued)

Lot Number: YK07013

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page

(90 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-001**

Description: **MW-18-102_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0653	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	25-150
13C2_6:2FTS		87	25-150
13C2_8:2FTS		71	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		69	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-001**

Description: **MW-18-102_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-002**

Description: **MW-18-103_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1110** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0703	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**11**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**13**		**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**190**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.95**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**8.8**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-002**
Description: **MW-18-103_110223**
Matrix: **Aqueous**
Date Sampled: **11/02/2023 1110**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-003**

Description: **MW-18-104_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0714	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.44**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.1**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		72	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-003**
Description: **MW-18-104_110223**
Matrix: **Aqueous**
Date Sampled: **11/02/2023 1200**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		65	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-004**

Description: **MW-18-105_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1315** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0735	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.72**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.6**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		67	25-150
13C3_PFHxS		63	25-150
13C3-HFPO-DA		66	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		68	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		71	25-150
13C6_PFDA		69	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-004**

Description: **MW-18-105_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1315** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		73	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		72	25-150
d5-EtFOSAA		65	25-150
d3-MeFOSAA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-005**

Description: **MW-19-114_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0746	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.8**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		89	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		75	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		68	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-005**

Description: **MW-19-114_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
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Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-006**

Description: **MW-18-98_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0756	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.84**	**J**	**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.79**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.3**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.1**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**180**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		71	25-150
13C4_PFBA		44	25-150
13C4_PFHpA		66	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-006**

Description: **MW-18-98_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	25-150
13C8_PFOS		70	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-007**

Description: **MW-18-99_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0817	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.99**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.1**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**69**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	195	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		73	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-007**

Description: **MW-18-99_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-008**

Description: **MW-19-112_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1145** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0657	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		80	4.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		80	6.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		80	16	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		80	20	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		80	8.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		80	21	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		80	4.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		80	7.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		80	9.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		40	4.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		40	7.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		40	5.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		40	7.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		40	6.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		40	5.9	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		40	5.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		40	5.2	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		40	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		40	4.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		40	6.9	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		40	4.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		40	8.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		40	5.4	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		40	5.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		40	6.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		40	20	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		56	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-008**
Description: **MW-19-112_110323**
Matrix: **Aqueous**
Date Sampled: **11/03/2023 1145**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	25-150
13C8_PFOS		70	25-150
13C8_PFOSA		67	10-150
13C9_PFNA		71	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-009**

Description: **MW-18-88_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0707	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**3.0**	**J**	**3.5**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.0**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.5**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**9.7**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**320**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	184	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		62	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		74	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		65	25-150
13C6_PFDA		72	25-150
13C7_PFUdA		65	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-009**

Description: **MW-18-88_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		67	25-150
13C8_PFOSA		68	10-150
13C9_PFNA		73	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0718	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	5	01/09/2024 2112	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**22**		**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**20**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**38**	**Q**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.8**		**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.5**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	Q	3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1200**	**E**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	213	25-150	H	101	25-150
13C2_6:2FTS	N	201	25-150	H	114	25-150
13C2_8:2FTS	N	197	25-150	H	97	25-150
13C2_PFDoA		79	25-150	H	64	25-150
13C2_PFTeDA		66	25-150	H	62	25-150
13C3_PFBS		74	25-150	H	70	25-150
13C3_PFHxS		69	25-150	H	76	25-150
13C3-HFPO-DA		55	25-150	H	60	25-150
13C4_PFBA	N	2.0	25-150	HN	2.0	25-150
13C4_PFHpA		65	25-150	H	75	25-150
13C5_PFHxA		65	25-150	H	64	25-150
13C5_PFPeA	N	9.0	25-150	HN	12	25-150
13C6_PFDA		78	25-150	H	86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		78	25-150	H	63	25-150
13C8_PFOA		78	25-150	H	80	25-150
13C8_PFOS		69	25-150	H	69	25-150
13C8_PFOSA		73	10-150	H	73	10-150
13C9_PFNA		74	25-150	H	71	25-150
d5-EtFOSAA		96	25-150	H	78	25-150
d3-MeFOSAA		91	25-150	H	71	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0718	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	5	01/09/2024 2112	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	33	2.0	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	33	2.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	33	6.7	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	33	8.3	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H	33	3.6	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	33	8.7	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	33	2.0	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	33	3.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	33	3.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	H	17	1.7	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	17	3.2	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**20**	**H**	**17**	**2.1**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	17	3.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	17	2.6	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	17	2.5	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**20**	**H**	**17**	**2.3**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	HQ	17	2.5	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	17	2.2	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	17	2.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.4**	**HJ**	**17**	**1.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.3**	**HJ**	**17**	**2.9**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	17	1.9	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**	**H**	**17**	**3.5**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	HQ	17	2.3	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	17	2.5	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H	17	2.2	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	17	2.6	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1200**	**H**	**17**	**8.4**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	213	25-150	H	101	25-150
13C2_6:2FTS	N	201	25-150	H	114	25-150
13C2_8:2FTS	N	197	25-150	H	97	25-150
13C2_PFDoA		79	25-150	H	64	25-150
13C2_PFTeDA		66	25-150	H	62	25-150
13C3_PFBS		74	25-150	H	70	25-150
13C3_PFHxS		69	25-150	H	76	25-150
13C3-HFPO-DA		55	25-150	H	60	25-150
13C4_PFBA	N	2.0	25-150	HN	2.0	25-150
13C4_PFHpA		65	25-150	H	75	25-150
13C5_PFHxA		65	25-150	H	64	25-150
13C5_PFPeA	N	9.0	25-150	HN	12	25-150
13C6_PFDA		78	25-150	H	86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		78	25-150	H	63	25-150
13C8_PFOA		78	25-150	H	80	25-150
13C8_PFOS		69	25-150	H	69	25-150
13C8_PFOSA		73	10-150	H	73	10-150
13C9_PFNA		74	25-150	H	71	25-150
d5-EtFOSAA		96	25-150	H	78	25-150
d3-MeFOSAA		91	25-150	H	71	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-011**

Description: **MW-18-100_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1535** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0357	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.8**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.0**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.8**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.9**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		119	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		77	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-011**

Description: **MW-18-100_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1535** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-012**

Description: **MW-18-95_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1630** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0408	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.4**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.62**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**55**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	219	25-150
13C2_6:2FTS	N	181	25-150
13C2_8:2FTS		114	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-012**

Description: **MW-18-95_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1630** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-013**

Description: **MW-18-91_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0542	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**52**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	175	25-150
13C2_6:2FTS	N	230	25-150
13C2_8:2FTS	N	206	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		65	25-150
13C3_PFHxS		69	25-150
13C3-HFPO-DA		60	25-150
13C4_PFBA		33	25-150
13C4_PFHpA		65	25-150
13C5_PFHxA		63	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-013**

Description: **MW-18-91_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		71	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-014**

Description: **UNK-15_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0553	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	10	12/22/2023 1458	ELC2	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**13**		**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.3**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.2**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**24**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.0**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1400**		**34**	**17**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	170	25-150		125	25-150
13C2_6:2FTS	N	177	25-150		100	25-150
13C2_8:2FTS		142	25-150		89	25-150
13C2_PFDoA		68	25-150		72	25-150
13C2_PFTeDA		58	25-150		65	25-150
13C3_PFBS		66	25-150		83	25-150
13C3_PFHxS		69	25-150		82	25-150
13C3-HFPO-DA		62	25-150		88	25-150
13C4_PFBA		39	25-150		79	25-150
13C4_PFHpA		63	25-150		83	25-150
13C5_PFHxA		62	25-150		88	25-150
13C5_PFPeA		55	25-150		90	25-150
13C6_PFDA		75	25-150		83	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-014**

Description: **UNK-15_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150		70	25-150
13C8_PFOA		74	25-150		77	25-150
13C8_PFOS		62	25-150		73	25-150
13C8_PFOSA		70	10-150		74	10-150
13C9_PFNA		68	25-150		78	25-150
d5-EtFOSAA		86	25-150		67	25-150
d3-MeFOSAA		83	25-150		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2111	ELC2	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	50	01/10/2024 1614	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	Q	6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	Q	6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	Q	6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	Q	6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	Q	6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	Q	6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	Q	3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	Q	3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	Q	3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	Q	3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	Q	3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	Q	3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	Q	3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	Q	3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	Q	3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	Q	3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	Q	3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	Q	3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	Q	3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	Q	3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	Q	3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	Q	3.4	1.7	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	0.00	25-150	H	102	25-150
13C2_6:2FTS	N	0.00	25-150	H	90	25-150
13C2_8:2FTS	N	0.00	25-150	H	84	25-150
13C2_PFDoA	N	0.00	25-150	H	80	25-150
13C2_PFTeDA	N	0.00	25-150	H	80	25-150
13C3_PFBS	N	0.00	25-150	H	77	25-150
13C3_PFHxS	N	0.00	25-150	H	95	25-150
13C3-HFPO-DA	N	0.00	25-150	H	88	25-150
13C4_PFBA	N	0.00	25-150	H	81	25-150
13C4_PFHpA	N	0.00	25-150	H	81	25-150
13C5_PFHxA	N	0.00	25-150	H	83	25-150
13C5_PFPeA	N	0.00	25-150	H	83	25-150
13C6_PFDA	N	0.00	25-150	H	84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA	N	0.00	25-150	H	84	25-150
13C8_PFOA	N	0.00	25-150	H	81	25-150
13C8_PFOS	N	0.00	25-150	H	90	25-150
13C8_PFOSA	N	0.00	10-150	H	84	10-150
13C9_PFNA	N	0.00	25-150	H	81	25-150
d5-EtFOSAA	N	0.00	25-150	H	95	25-150
d3-MeFOSAA	N	0.00	25-150	H	88	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2111	ELC2	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	50	01/10/2024 1614	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	350	21	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	350	29	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	350	70	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	350	87	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H	350	38	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	350	90	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	350	21	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	350	33	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	350	40	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**95**	**HJ**	**170**	**18**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	170	34	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**330**	**H**	**170**	**22**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	170	31	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	170	27	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**310**	**H**	**170**	**26**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1400**	**H**	**170**	**24**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	H	170	26	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	170	23	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	170	20	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	H	170	19	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**40**	**HJ**	**170**	**30**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	170	20	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**	**HJ**	**170**	**36**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	H	170	24	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	170	26	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H	170	23	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	170	27	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**9800**	**H**	**170**	**87**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	0.00	25-150	H	102	25-150
13C2_6:2FTS	N	0.00	25-150	H	90	25-150
13C2_8:2FTS	N	0.00	25-150	H	84	25-150
13C2_PFDoA	N	0.00	25-150	H	80	25-150
13C2_PFTeDA	N	0.00	25-150	H	80	25-150
13C3_PFBS	N	0.00	25-150	H	77	25-150
13C3_PFHxS	N	0.00	25-150	H	95	25-150
13C3-HFPO-DA	N	0.00	25-150	H	88	25-150
13C4_PFBA	N	0.00	25-150	H	81	25-150
13C4_PFHpA	N	0.00	25-150	H	81	25-150
13C5_PFHxA	N	0.00	25-150	H	83	25-150
13C5_PFPeA	N	0.00	25-150	H	83	25-150
13C6_PFDA	N	0.00	25-150	H	84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA	N	0.00	25-150	H	84	25-150
13C8_PFOA	N	0.00	25-150	H	81	25-150
13C8_PFOS	N	0.00	25-150	H	90	25-150
13C8_PFOSA	N	0.00	10-150	H	84	10-150
13C9_PFNA	N	0.00	25-150	H	81	25-150
d5-EtFOSAA	N	0.00	25-150	H	95	25-150
d3-MeFOSAA	N	0.00	25-150	H	88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ90867-001
Batch: 90867
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/30/2023 0621
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/30/2023 0621
8:2 FTS	ND		1	8.0	1.6	ng/L	11/30/2023 0621
6:2 FTS	ND		1	8.0	2.0	ng/L	11/30/2023 0621
4:2 FTS	ND		1	8.0	0.87	ng/L	11/30/2023 0621
GenX	ND		1	8.0	2.1	ng/L	11/30/2023 0621
ADONA	ND		1	8.0	0.48	ng/L	11/30/2023 0621
EtFOSAA	ND		1	8.0	0.75	ng/L	11/30/2023 0621
MeFOSAA	ND		1	8.0	0.93	ng/L	11/30/2023 0621
PFBS	ND		1	4.0	0.41	ng/L	11/30/2023 0621
PFDS	ND		1	4.0	0.78	ng/L	11/30/2023 0621
PFHpS	ND		1	4.0	0.50	ng/L	11/30/2023 0621
PFNS	ND		1	4.0	0.71	ng/L	11/30/2023 0621
PFOSA	ND		1	4.0	0.61	ng/L	11/30/2023 0621
PFPeS	ND		1	4.0	0.59	ng/L	11/30/2023 0621
PFHxS	ND		1	4.0	0.55	ng/L	11/30/2023 0621
PFBA	ND		1	4.0	0.60	ng/L	11/30/2023 0621
PFDA	ND		1	4.0	0.52	ng/L	11/30/2023 0621
PFDoA	ND		1	4.0	0.47	ng/L	11/30/2023 0621
PFHpA	ND		1	4.0	0.45	ng/L	11/30/2023 0621
PFHxA	ND		1	4.0	0.69	ng/L	11/30/2023 0621
PFNA	ND		1	4.0	0.46	ng/L	11/30/2023 0621
PFOA	ND		1	4.0	0.83	ng/L	11/30/2023 0621
PFPeA	ND		1	4.0	0.54	ng/L	11/30/2023 0621
PFTeDA	ND		1	4.0	0.60	ng/L	11/30/2023 0621
PFTrDA	ND		1	4.0	0.53	ng/L	11/30/2023 0621
PFUdA	ND		1	4.0	0.63	ng/L	11/30/2023 0621
PFOS	ND		1	4.0	2.0	ng/L	11/30/2023 0621

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		90	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		80	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90867-001
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	25-150
13C7_PFUdA		79	25-150
13C8_PFOA		83	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		76	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90867-002
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	96	50-150	11/30/2023 0631
11Cl-PF3OUdS	15	15		1	96	50-150	11/30/2023 0631
8:2 FTS	15	18		1	118	50-150	11/30/2023 0631
6:2 FTS	15	17		1	111	50-150	11/30/2023 0631
4:2 FTS	15	15		1	100	50-150	11/30/2023 0631
GenX	32	33		1	103	50-150	11/30/2023 0631
ADONA	15	15		1	99	50-150	11/30/2023 0631
EtFOSAA	16	16		1	102	50-150	11/30/2023 0631
MeFOSAA	16	16		1	102	50-150	11/30/2023 0631
PFBS	14	16		1	111	50-150	11/30/2023 0631
PFDS	15	16		1	101	50-150	11/30/2023 0631
PFHpS	15	16		1	102	50-150	11/30/2023 0631
PFNS	15	16		1	107	50-150	11/30/2023 0631
PFOSA	16	16		1	98	50-150	11/30/2023 0631
PFPeS	15	17		1	110	50-150	11/30/2023 0631
PFHxS	15	15		1	102	50-150	11/30/2023 0631
PFBA	16	19		1	119	50-150	11/30/2023 0631
PFDA	16	16		1	101	50-150	11/30/2023 0631
PFDoA	16	15		1	94	50-150	11/30/2023 0631
PFHpA	16	17		1	104	50-150	11/30/2023 0631
PFHxA	16	18		1	112	50-150	11/30/2023 0631
PFNA	16	17		1	107	50-150	11/30/2023 0631
PFOA	16	18		1	110	50-150	11/30/2023 0631
PFPeA	16	18		1	112	50-150	11/30/2023 0631
PFTeDA	16	17		1	107	50-150	11/30/2023 0631
PFTrDA	16	14		1	88	50-150	11/30/2023 0631
PFUdA	16	17		1	106	50-150	11/30/2023 0631
PFOS	15	16		1	106	50-150	11/30/2023 0631

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		81	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90867-002
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		89	25-150
13C8_PFOS		86	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07013-003MS
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	13		1	101	50-150	11/30/2023 0725
11Cl-PF3OUdS	ND	13	13		1	102	50-150	11/30/2023 0725
8:2 FTS	ND	13	15		1	117	50-150	11/30/2023 0725
6:2 FTS	ND	13	16		1	122	50-150	11/30/2023 0725
4:2 FTS	ND	13	13		1	102	50-150	11/30/2023 0725
GenX	ND	28	29		1	105	50-150	11/30/2023 0725
ADONA	ND	13	14		1	110	50-150	11/30/2023 0725
EtFOSAA	ND	14	15		1	108	50-150	11/30/2023 0725
MeFOSAA	ND	14	14		1	102	50-150	11/30/2023 0725
PFBS	0.44	12	14		1	111	50-150	11/30/2023 0725
PFDS	ND	13	14		1	104	50-150	11/30/2023 0725
PFHpS	ND	13	16		1	119	50-150	11/30/2023 0725
PFNS	ND	13	14		1	105	50-150	11/30/2023 0725
PFOSA	ND	14	14		1	100	50-150	11/30/2023 0725
PFPeS	ND	13	14		1	111	50-150	11/30/2023 0725
PFHxS	ND	13	13		1	106	50-150	11/30/2023 0725
PFBA	ND	14	16		1	118	50-150	11/30/2023 0725
PFDA	ND	14	14		1	104	50-150	11/30/2023 0725
PFDoA	ND	14	15		1	112	50-150	11/30/2023 0725
PFHpA	ND	14	14		1	105	50-150	11/30/2023 0725
PFHxA	ND	14	15		1	111	50-150	11/30/2023 0725
PFNA	ND	14	14		1	100	50-150	11/30/2023 0725
PFOA	ND	14	14		1	104	50-150	11/30/2023 0725
PFPeA	ND	14	16		1	119	50-150	11/30/2023 0725
PFTeDA	ND	14	15		1	108	50-150	11/30/2023 0725
PFTrDA	ND	14	13		1	96	50-150	11/30/2023 0725
PFUdA	ND	14	16		1	113	50-150	11/30/2023 0725
PFOS	4.1	13	19		1	116	50-150	11/30/2023 0725

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		87	25-150
13C2_8:2FTS		63	25-150
13C2_PFDoA		64	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		67	25-150
13C3-HFPO-DA		71	25-150
13C4_PFBA		56	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		73	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YK07013-003MS
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		72	25-150
13C7_PFUdA		71	25-150
13C8_PFOA		80	25-150
13C8_PFOS		67	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		70	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		66	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK07013-006DU
Batch: 90867
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	11/30/2023 0807
11Cl-PF3OUdS	ND	ND		1	0.00	20	11/30/2023 0807
8:2 FTS	ND	ND		1	0.00	20	11/30/2023 0807
6:2 FTS	ND	ND		1	0.00	20	11/30/2023 0807
4:2 FTS	ND	ND		1	0.00	20	11/30/2023 0807
GenX	ND	ND		1	0.00	20	11/30/2023 0807
ADONA	ND	ND		1	0.00	20	11/30/2023 0807
EtFOSAA	ND	ND		1	0.00	20	11/30/2023 0807
MeFOSAA	ND	ND		1	0.00	20	11/30/2023 0807
PFBS	1.8	1.6	J	1	12	20	11/30/2023 0807
PFDS	ND	ND		1	0.00	20	11/30/2023 0807
PFHpS	0.84	0.51	J,+	1	49	20	11/30/2023 0807
PFNS	ND	ND		1	0.00	20	11/30/2023 0807
PFOSA	ND	ND		1	0.00	20	11/30/2023 0807
PFPeS	ND	ND		1	0.00	20	11/30/2023 0807
PFHxS	0.79	1.0	J,+	1	26	20	11/30/2023 0807
PFBA	20	20		1	1.5	20	11/30/2023 0807
PFDA	ND	0.55	J,+	1	28	20	11/30/2023 0807
PFDoA	ND	ND		1	0.00	20	11/30/2023 0807
PFHpA	3.3	2.7	J,+	1	22	20	11/30/2023 0807
PFHxA	5.7	6.2		1	8.5	20	11/30/2023 0807
PFNA	3.3	3.6		1	8.3	20	11/30/2023 0807
PFOA	5.1	5.2		1	0.50	20	11/30/2023 0807
PFPeA	4.3	4.2		1	1.4	20	11/30/2023 0807
PFTeDA	ND	ND		1	0.00	20	11/30/2023 0807
PFTrDA	ND	ND		1	0.00	20	11/30/2023 0807
PFUdA	ND	ND		1	0.00	20	11/30/2023 0807
PFOS	180	190		1	2.7	20	11/30/2023 0807

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	151	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		62	25-150
13C3_PFHxS		68	25-150
13C3-HFPO-DA		62	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		66	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YK07013-006DU
Batch: 90867
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/27/2023 2036

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		74	25-150
13C7_PFUdA		75	25-150
13C8_PFOA		85	25-150
13C8_PFOS		63	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		72	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		64	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90904-001
Batch: 90904
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	12/16/2023 0450
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	12/16/2023 0450
8:2 FTS	ND		1	8.0	1.6	ng/L	12/16/2023 0450
6:2 FTS	ND		1	8.0	2.0	ng/L	12/16/2023 0450
4:2 FTS	ND		1	8.0	0.87	ng/L	12/16/2023 0450
GenX	ND		1	8.0	2.1	ng/L	12/16/2023 0450
ADONA	ND		1	8.0	0.48	ng/L	12/16/2023 0450
EtFOSAA	ND		1	8.0	0.75	ng/L	12/16/2023 0450
MeFOSAA	ND		1	8.0	0.93	ng/L	12/16/2023 0450
PFBS	ND		1	4.0	0.41	ng/L	12/16/2023 0450
PFDS	ND		1	4.0	0.78	ng/L	12/16/2023 0450
PFHpS	ND		1	4.0	0.50	ng/L	12/16/2023 0450
PFNS	ND		1	4.0	0.71	ng/L	12/16/2023 0450
PFOSA	ND		1	4.0	0.61	ng/L	12/16/2023 0450
PFPeS	ND		1	4.0	0.59	ng/L	12/16/2023 0450
PFHxS	ND		1	4.0	0.55	ng/L	12/16/2023 0450
PFBA	ND		1	4.0	0.60	ng/L	12/16/2023 0450
PFDA	ND		1	4.0	0.52	ng/L	12/16/2023 0450
PFDoA	ND		1	4.0	0.47	ng/L	12/16/2023 0450
PFHpA	ND		1	4.0	0.45	ng/L	12/16/2023 0450
PFHxA	ND		1	4.0	0.69	ng/L	12/16/2023 0450
PFNA	ND		1	4.0	0.46	ng/L	12/16/2023 0450
PFOA	ND		1	4.0	0.83	ng/L	12/16/2023 0450
PFPeA	ND		1	4.0	0.54	ng/L	12/16/2023 0450
PFTeDA	ND		1	4.0	0.60	ng/L	12/16/2023 0450
PFTrDA	ND		1	4.0	0.53	ng/L	12/16/2023 0450
PFUdA	ND		1	4.0	0.63	ng/L	12/16/2023 0450
PFOS	ND		1	4.0	2.0	ng/L	12/16/2023 0450

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		90	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ90904-001
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		96	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		91	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit

ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90904-002
Batch: 90904
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	106	50-150	12/18/2023 2029
11Cl-PF3OUdS	15	16		1	109	50-150	12/18/2023 2029
8:2 FTS	15	17		1	109	50-150	12/18/2023 2029
6:2 FTS	15	17		1	109	50-150	12/18/2023 2029
4:2 FTS	15	19		1	125	50-150	12/18/2023 2029
GenX	32	35		1	108	50-150	12/18/2023 2029
ADONA	15	18		1	117	50-150	12/18/2023 2029
EtFOSAA	16	19		1	119	50-150	12/18/2023 2029
MeFOSAA	16	17		1	106	50-150	12/18/2023 2029
PFBS	14	16		1	111	50-150	12/18/2023 2029
PFDS	15	17		1	111	50-150	12/18/2023 2029
PFHpS	15	15		1	101	50-150	12/18/2023 2029
PFNS	15	15		1	100	50-150	12/18/2023 2029
PFOSA	16	20		1	125	50-150	12/18/2023 2029
PFPeS	15	18		1	120	50-150	12/18/2023 2029
PFHxS	15	17		1	114	50-150	12/18/2023 2029
PFBA	16	19		1	116	50-150	12/18/2023 2029
PFDA	16	19		1	121	50-150	12/18/2023 2029
PFDoA	16	17		1	109	50-150	12/18/2023 2029
PFHpA	16	18		1	112	50-150	12/18/2023 2029
PFHxA	16	18		1	112	50-150	12/18/2023 2029
PFNA	16	17		1	109	50-150	12/18/2023 2029
PFOA	16	16		1	101	50-150	12/18/2023 2029
PFPeA	16	19		1	117	50-150	12/18/2023 2029
PFTeDA	16	18		1	113	50-150	12/18/2023 2029
PFTrDA	16	17		1	104	50-150	12/18/2023 2029
PFUdA	16	18		1	109	50-150	12/18/2023 2029
PFOS	15	18		1	122	50-150	12/18/2023 2029

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		75	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		74	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ90904-002
Batch: 90904
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/28/2023 1053

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		69	25-150
13C7_PFUdA		71	25-150
13C8_PFOA		83	25-150
13C8_PFOS		65	25-150
13C8_PFOSA		68	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		72	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ92812-001
Batch: 92812
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/21/2023 0314

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	01/09/2024 2050
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	01/09/2024 2050
8:2 FTS	ND		1	8.0	1.6	ng/L	01/09/2024 2050
6:2 FTS	ND		1	8.0	2.0	ng/L	01/09/2024 2050
4:2 FTS	ND		1	8.0	0.87	ng/L	01/09/2024 2050
GenX	ND		1	8.0	2.1	ng/L	01/09/2024 2050
ADONA	ND		1	8.0	0.48	ng/L	01/09/2024 2050
EtFOSAA	ND		1	8.0	0.75	ng/L	01/09/2024 2050
MeFOSAA	ND		1	8.0	0.93	ng/L	01/09/2024 2050
PFBS	ND		1	4.0	0.41	ng/L	01/09/2024 2050
PFDS	ND		1	4.0	0.78	ng/L	01/09/2024 2050
PFHpS	ND		1	4.0	0.50	ng/L	01/09/2024 2050
PFNS	ND		1	4.0	0.71	ng/L	01/09/2024 2050
PFOSA	ND		1	4.0	0.61	ng/L	01/09/2024 2050
PFPeS	ND		1	4.0	0.59	ng/L	01/09/2024 2050
PFHxS	ND		1	4.0	0.55	ng/L	01/09/2024 2050
PFBA	ND		1	4.0	0.60	ng/L	01/09/2024 2050
PFDA	ND		1	4.0	0.52	ng/L	01/09/2024 2050
PFDoA	ND		1	4.0	0.47	ng/L	01/09/2024 2050
PFHpA	ND		1	4.0	0.45	ng/L	01/09/2024 2050
PFHxA	ND		1	4.0	0.69	ng/L	01/09/2024 2050
PFNA	ND		1	4.0	0.46	ng/L	01/09/2024 2050
PFOA	ND		1	4.0	0.83	ng/L	01/09/2024 2050
PFPeA	ND		1	4.0	0.54	ng/L	01/09/2024 2050
PFTeDA	ND		1	4.0	0.60	ng/L	01/09/2024 2050
PFTrDA	ND		1	4.0	0.53	ng/L	01/09/2024 2050
PFUdA	ND		1	4.0	0.63	ng/L	01/09/2024 2050
PFOS	ND		1	4.0	2.0	ng/L	01/09/2024 2050

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		79	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ92812-001
Batch: 92812
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/21/2023 0314

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		72	25-150
13C8_PFOA		89	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		78	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ92812-002
Batch: 92812
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/21/2023 0314

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	101	50-150	01/11/2024 1501
11Cl-PF3OUdS	15	15		1	98	50-150	01/11/2024 1501
8:2 FTS	15	15		1	99	50-150	01/11/2024 1501
6:2 FTS	15	16		1	105	50-150	01/11/2024 1501
4:2 FTS	15	16		1	105	50-150	01/11/2024 1501
GenX	32	29		1	91	50-150	01/11/2024 1501
ADONA	15	16		1	103	50-150	01/11/2024 1501
EtFOSAA	16	16		1	102	50-150	01/11/2024 1501
MeFOSAA	16	16		1	97	50-150	01/11/2024 1501
PFBS	14	14		1	98	50-150	01/11/2024 1501
PFDS	15	14		1	91	50-150	01/11/2024 1501
PFHpS	15	16		1	103	50-150	01/11/2024 1501
PFNS	15	16		1	104	50-150	01/11/2024 1501
PFOSA	16	19		1	116	50-150	01/11/2024 1501
PFPeS	15	16		1	106	50-150	01/11/2024 1501
PFHxS	15	15		1	101	50-150	01/11/2024 1501
PFBA	16	16		1	102	50-150	01/11/2024 1501
PFDA	16	19		1	121	50-150	01/11/2024 1501
PFDoA	16	15		1	94	50-150	01/11/2024 1501
PFHpA	16	16		1	101	50-150	01/11/2024 1501
PFHxA	16	17		1	103	50-150	01/11/2024 1501
PFNA	16	16		1	100	50-150	01/11/2024 1501
PFOA	16	17		1	104	50-150	01/11/2024 1501
PFPeA	16	17		1	103	50-150	01/11/2024 1501
PFTeDA	16	17		1	108	50-150	01/11/2024 1501
PFTrDA	16	14		1	84	50-150	01/11/2024 1501
PFUdA	16	17		1	105	50-150	01/11/2024 1501
PFOS	15	19		1	129	50-150	01/11/2024 1501

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		84	25-150
13C2_6:2FTS		75	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		80	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ92812-002
Batch: 92812
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/21/2023 0314

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		71	25-150
13C8_PFOA		77	25-150
13C8_PFOS		71	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical® Chain of Custody Record

Plant 3

Pace Analytical Services, LLC.
105 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt			Telephone No. / E-mail: (248)809-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: X			Analysis (Attach list if more space is needed)	Page 1 of 2
City: Novi	State: MI	Zip Code: 48377	Printed Name: Austin Westhuis		
Project Name: RACER Lansing GWS					YK07013
Project Number: 30171056.0370A	P.O. No.: US3460011578				KES2

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 kit	Field Filtered	PFAS (Method 537M, EGLE 28 compounds)	Remarks / Cooler I.D.
MW-18-102_110223	11/2/23	1005	G	X				2							2	
MW-18-103_110223	11/2/23	1110	G	X				2							2	
MW-18-104_110223	11/2/23	1200	G	X				2							2	
MW-18-105_110223	11/2/23	1315	G	X				2							2	
MW-19-114_110223	11/2/23	1415	G	X				2							2	
MW-18-98_110223	11/2/23	1510	G	X				2							2	
MW-18-99_110323	11/3/23	1045	G	X				2							2	
MW-19-112_110323	11/3/23	1145	G	X				2							2	
MW-18-88_110323	11/3/23	1250	G	X				2							2	
MW-18-90_110323	11/3/23	1425	G	X				2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements:

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis/Arcadis	11/6/23	1630	1. Received by: FedEx	11/6/23	1630
2. Relinquished by:	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by	11.7.23	950	4. Laboratory Received by	11.7.23	950

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY: Received on Ice (Check) ☑ Y ☐ N ☐ Ice Pack

Receipt Temp: 3.2 °C

Temp. Blank: ☐ Y / ☒ N

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Plant 3

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number YK07013

KES2

| | | |

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KDRW / 11/07/2023 Lot #:

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.2 / 3.2 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☐ Yes	☑ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25329

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐

Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Marina Samp

Project Name: RACER Lansing PFAS

Project Number: 30171056

Lot Number:**YJ26022**

Date Completed:11/13/2023

11/13/2023 2:29 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Arcadis U.S., Inc.
Lot Number: YJ26022

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.4 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18. If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Samples YJ26022-001, YJ26022-003, YJ26022-005, YJ26022-008, YJ26022-017, YJ26022-019 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Surrogate recovery for the following samples was outside the upper control limit: YJ26022-001, YJ26022-002, YJ26022-003, YJ26022-004, YJ26022-005, YJ26022-006, YJ26022-007, YJ26022-008, YJ26022-009, YJ26022-010, YJ26022-011, YJ26022-012, YJ26022-013, YJ26022-014, YJ26022-015, YJ26022-016, YJ26022-017, YJ26022-018, YJ26022-019, YJ26022-020, YJ26022-021, YJ26022-022, YJ26022-023. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The method blank associated with batches 88543, 89091 had 6:2 FTS detected at a concentration that was above the MDL but below the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

Sample Summary

Arcadis U.S., Inc.

Lot Number: YJ26022

Project Name: RACER Lansing PFAS

Project Number: 30171056

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MichAve-MH-3_102423	Aqueous	10/24/2023 0900	10/26/2023
002	Verlinden-MH-5_102423	Aqueous	10/24/2023 0920	10/26/2023
003	Osborn-Sanitary-W_102423	Aqueous	10/24/2023 0955	10/26/2023
004	Osborn-Sanitary-SE_102423	Aqueous	10/24/2023 1000	10/26/2023
005	Osborn-Sanitary-N_102423	Aqueous	10/24/2023 1010	10/26/2023
006	Osborn-MH-2-SE_102423	Aqueous	10/24/2023 1105	10/26/2023
007	Osborn-MH-2-W_102423	Aqueous	10/24/2023 1115	10/26/2023
008	Osborn-MH-3_102423	Aqueous	10/24/2023 1125	10/26/2023
009	Osborn-CB-2_102423	Aqueous	10/24/2023 1135	10/26/2023
010	Osborn-MH-4-E_102423	Aqueous	10/24/2023 1210	10/26/2023
011	Osborn-MH-4_102423	Aqueous	10/24/2023 1210	10/26/2023
012	Osborn-MH-4-NE_102423	Aqueous	10/24/2023 1215	10/26/2023
013	Osborn-MH-1-SW_102423	Aqueous	10/24/2023 1230	10/26/2023
014	Osborn-MH-1-SE_102423	Aqueous	10/24/2023 1240	10/26/2023
015	Osborn-MH-1-N_102423	Aqueous	10/24/2023 1245	10/26/2023
016	Osborn-MH-1-E_102423	Aqueous	10/24/2023 1250	10/26/2023
017	Stanley-MH-1_102423	Aqueous	10/24/2023 1310	10/26/2023
018	P2-MH-2_102423	Aqueous	10/24/2023 1505	10/26/2023
019	P3-MH-284_102423	Aqueous	10/24/2023 1520	10/26/2023
020	P2-MH-W_102423	Aqueous	10/24/2023 1555	10/26/2023
021	DUP-01_102423	Aqueous	10/24/2023	10/26/2023
022	DUP-02_102423	Aqueous	10/24/2023	10/26/2023
023	EB-01	Aqueous	10/24/2023	10/26/2023
024	FB-01	Aqueous	10/24/2023	10/26/2023
025	Trip Blank	Aqueous	10/24/2023	

(25 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: YJ26022

Project Name: RACER Lansing PFAS

Project Number: 30171056

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MichAve-MH-3_102423	Aqueous	PFBS	PFAS by ID	2.5	J	ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFHxS	PFAS by ID	2.6	J	ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFBA	PFAS by ID	6.2		ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFHpA	PFAS by ID	1.7	J	ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFHxA	PFAS by ID	2.1	J	ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFOA	PFAS by ID	4.5		ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFPeA	PFAS by ID	2.6	J	ng/L	11
001	MichAve-MH-3_102423	Aqueous	PFOS	PFAS by ID	3.7	J	ng/L	11
002	Verlinden-MH-5_102423	Aqueous	PFBS	PFAS by ID	2.8	J	ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFBA	PFAS by ID	13		ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFDA	PFAS by ID	1.2	J	ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFHpA	PFAS by ID	19		ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFHxA	PFAS by ID	28		ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFNA	PFAS by ID	4.0	J	ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFOA	PFAS by ID	39		ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFPeA	PFAS by ID	27		ng/L	13
002	Verlinden-MH-5_102423	Aqueous	PFOS	PFAS by ID	13		ng/L	13
006	Osborn-MH-2-SE_102423	Aqueous	PFBS	PFAS by ID	0.96	J	ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFHxS	PFAS by ID	0.81	J	ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFBA	PFAS by ID	9.3		ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFDA	PFAS by ID	1.0	J	ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFHpA	PFAS by ID	6.4		ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFHxA	PFAS by ID	9.5		ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFNA	PFAS by ID	2.7	J	ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFOA	PFAS by ID	19		ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFPeA	PFAS by ID	6.5		ng/L	15
006	Osborn-MH-2-SE_102423	Aqueous	PFOS	PFAS by ID	15		ng/L	15
007	Osborn-MH-2-W_102423	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFBA	PFAS by ID	12		ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFHpA	PFAS by ID	8.4		ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFHxA	PFAS by ID	15		ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFNA	PFAS by ID	2.1	J	ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFOA	PFAS by ID	24		ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFPeA	PFAS by ID	10		ng/L	17
007	Osborn-MH-2-W_102423	Aqueous	PFOS	PFAS by ID	10		ng/L	17
008	Osborn-MH-3_102423	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFBA	PFAS by ID	13		ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFDA	PFAS by ID	0.64	J	ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFHpA	PFAS by ID	7.4		ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFHxA	PFAS by ID	12		ng/L	19

Detection Summary (Continued)

Lot Number: YJ26022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
008	Osborn-MH-3_102423	Aqueous	PFNA	PFAS by ID	2.3	J	ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFOA	PFAS by ID	25		ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFPeA	PFAS by ID	8.3		ng/L	19
008	Osborn-MH-3_102423	Aqueous	PFOS	PFAS by ID	14		ng/L	19
009	Osborn-CB-2_102423	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFHxS	PFAS by ID	0.95	J	ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFBA	PFAS by ID	8.8		ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFDA	PFAS by ID	1.0	J	ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFHpA	PFAS by ID	6.3		ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFHxA	PFAS by ID	9.1		ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFNA	PFAS by ID	2.7	J	ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFOA	PFAS by ID	19		ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFPeA	PFAS by ID	6.2		ng/L	21
009	Osborn-CB-2_102423	Aqueous	PFOS	PFAS by ID	16		ng/L	21
010	Osborn-MH-4-E_102423	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFHxS	PFAS by ID	0.98	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFBA	PFAS by ID	6.5		ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFDA	PFAS by ID	0.57	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFHpA	PFAS by ID	3.7	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFHxA	PFAS by ID	6.3		ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFNA	PFAS by ID	1.3	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFOA	PFAS by ID	9.5		ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFPeA	PFAS by ID	3.7	J	ng/L	23
010	Osborn-MH-4-E_102423	Aqueous	PFOS	PFAS by ID	10		ng/L	23
011	Osborn-MH-4_102423	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFBA	PFAS by ID	6.9		ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFDA	PFAS by ID	0.68	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFHpA	PFAS by ID	3.8	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFHxA	PFAS by ID	5.5		ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFNA	PFAS by ID	1.4	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFOA	PFAS by ID	11		ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFPeA	PFAS by ID	3.9	J	ng/L	25
011	Osborn-MH-4_102423	Aqueous	PFOS	PFAS by ID	17		ng/L	25
012	Osborn-MH-4-NE_102423	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFBA	PFAS by ID	8.6		ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFDA	PFAS by ID	0.85	J	ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFHpA	PFAS by ID	4.5		ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFHxA	PFAS by ID	7.3		ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFNA	PFAS by ID	1.7	J	ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFOA	PFAS by ID	14		ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFPeA	PFAS by ID	4.7		ng/L	27
012	Osborn-MH-4-NE_102423	Aqueous	PFOS	PFAS by ID	31		ng/L	27
013	Osborn-MH-1-SW_102423	Aqueous	EtFOSAA	PFAS by ID	1.3	J	ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFBA	PFAS by ID	16		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFDA	PFAS by ID	7.0		ng/L	29

Detection Summary (Continued)

Lot Number: YJ26022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
013	Osborn-MH-1-SW_102423	Aqueous	PFHpA	PFAS by ID	15		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFHxA	PFAS by ID	19		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFNA	PFAS by ID	6.2		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFOA	PFAS by ID	29		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFPeA	PFAS by ID	16		ng/L	29
013	Osborn-MH-1-SW_102423	Aqueous	PFOS	PFAS by ID	27		ng/L	29
014	Osborn-MH-1-SE_102423	Aqueous	PFBS	PFAS by ID	1.1	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFHxS	PFAS by ID	1.2	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFBA	PFAS by ID	6.8		ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFDA	PFAS by ID	0.72	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFHpA	PFAS by ID	3.9	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFHxA	PFAS by ID	5.8		ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFNA	PFAS by ID	1.5	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFOA	PFAS by ID	12		ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFPeA	PFAS by ID	3.8	J	ng/L	31
014	Osborn-MH-1-SE_102423	Aqueous	PFOS	PFAS by ID	16		ng/L	31
015	Osborn-MH-1-N_102423	Aqueous	PFBS	PFAS by ID	1.7	J	ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFHxS	PFAS by ID	1.9	J	ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFBA	PFAS by ID	14		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFDA	PFAS by ID	4.4		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFHpA	PFAS by ID	12		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFHxA	PFAS by ID	15		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFNA	PFAS by ID	5.2		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFOA	PFAS by ID	26		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFPeA	PFAS by ID	13		ng/L	33
015	Osborn-MH-1-N_102423	Aqueous	PFOS	PFAS by ID	18		ng/L	33
016	Osborn-MH-1-E_102423	Aqueous	PFHxS	PFAS by ID	2.1	J	ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFBA	PFAS by ID	13		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFDA	PFAS by ID	4.6		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFHpA	PFAS by ID	12		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFHxA	PFAS by ID	14		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFNA	PFAS by ID	5.4		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFOA	PFAS by ID	25		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFPeA	PFAS by ID	13		ng/L	35
016	Osborn-MH-1-E_102423	Aqueous	PFOS	PFAS by ID	20		ng/L	35
017	Stanley-MH-1_102423	Aqueous	PFHxS	PFAS by ID	2.0	J	ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFBA	PFAS by ID	14		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFDA	PFAS by ID	4.6		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFHpA	PFAS by ID	14		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFHxA	PFAS by ID	15		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFNA	PFAS by ID	4.9		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFOA	PFAS by ID	30		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFPeA	PFAS by ID	13		ng/L	37
017	Stanley-MH-1_102423	Aqueous	PFOS	PFAS by ID	22		ng/L	37
018	P2-MH-2_102423	Aqueous	PFBS	PFAS by ID	2.2	J	ng/L	39
018	P2-MH-2_102423	Aqueous	PFHxS	PFAS by ID	4.4		ng/L	39
018	P2-MH-2_102423	Aqueous	PFBA	PFAS by ID	9.7		ng/L	39
018	P2-MH-2_102423	Aqueous	PFDA	PFAS by ID	2.1	J	ng/L	39

Detection Summary (Continued)

Lot Number: YJ26022

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
018	P2-MH-2_102423	Aqueous	PFHpA	PFAS by ID	9.1		ng/L	39
018	P2-MH-2_102423	Aqueous	PFHxA	PFAS by ID	11		ng/L	39
018	P2-MH-2_102423	Aqueous	PFNA	PFAS by ID	2.9	J	ng/L	39
018	P2-MH-2_102423	Aqueous	PFOA	PFAS by ID	20		ng/L	39
018	P2-MH-2_102423	Aqueous	PFPeA	PFAS by ID	8.5		ng/L	39
018	P2-MH-2_102423	Aqueous	PFOS	PFAS by ID	18		ng/L	39
019	P3-MH-284_102423	Aqueous	PFBS	PFAS by ID	0.92	J	ng/L	41
019	P3-MH-284_102423	Aqueous	PFBA	PFAS by ID	1.4	J	ng/L	41
019	P3-MH-284_102423	Aqueous	PFHxA	PFAS by ID	0.82	J	ng/L	41
019	P3-MH-284_102423	Aqueous	PFPeA	PFAS by ID	0.75	J	ng/L	41
019	P3-MH-284_102423	Aqueous	PFOS	PFAS by ID	7.0		ng/L	41
020	P2-MH-W_102423	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	43
020	P2-MH-W_102423	Aqueous	PFHxS	PFAS by ID	2.5	J	ng/L	43
020	P2-MH-W_102423	Aqueous	PFBA	PFAS by ID	3.9		ng/L	43
020	P2-MH-W_102423	Aqueous	PFHpA	PFAS by ID	0.82	J	ng/L	43
020	P2-MH-W_102423	Aqueous	PFOA	PFAS by ID	3.4	J	ng/L	43
020	P2-MH-W_102423	Aqueous	PFPeA	PFAS by ID	1.4	J	ng/L	43
020	P2-MH-W_102423	Aqueous	PFOS	PFAS by ID	7.3		ng/L	43
021	DUP-01_102423	Aqueous	EtFOSAA	PFAS by ID	1.1	J	ng/L	45
021	DUP-01_102423	Aqueous	PFHxS	PFAS by ID	1.7	J	ng/L	45
021	DUP-01_102423	Aqueous	PFBA	PFAS by ID	15		ng/L	45
021	DUP-01_102423	Aqueous	PFDA	PFAS by ID	7.7		ng/L	45
021	DUP-01_102423	Aqueous	PFHpA	PFAS by ID	16		ng/L	45
021	DUP-01_102423	Aqueous	PFHxA	PFAS by ID	18		ng/L	45
021	DUP-01_102423	Aqueous	PFNA	PFAS by ID	7.3		ng/L	45
021	DUP-01_102423	Aqueous	PFOA	PFAS by ID	31		ng/L	45
021	DUP-01_102423	Aqueous	PFPeA	PFAS by ID	17		ng/L	45
021	DUP-01_102423	Aqueous	PFOS	PFAS by ID	28		ng/L	45
022	DUP-02_102423	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	47
022	DUP-02_102423	Aqueous	PFHxS	PFAS by ID	2.4	J	ng/L	47
022	DUP-02_102423	Aqueous	PFBA	PFAS by ID	4.2		ng/L	47
022	DUP-02_102423	Aqueous	PFHpA	PFAS by ID	0.63	J	ng/L	47
022	DUP-02_102423	Aqueous	PFOA	PFAS by ID	2.8	J	ng/L	47
022	DUP-02_102423	Aqueous	PFPeA	PFAS by ID	1.3	J	ng/L	47
022	DUP-02_102423	Aqueous	PFOS	PFAS by ID	3.9		ng/L	47

(174 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-001**

Description: **MichAve-MH-3_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 0900** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/27/2023 2257	BWS	10/27/2023 0818	88543

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	0.66	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	0.88	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	0.75	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	0.93	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**4.0**	**0.42**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.78	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.71	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.6**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.2**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.7**	**J**	**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.1**	**J**	**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	0.46	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.5**		**4.0**	**0.83**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.6**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.7**	**J**	**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	296	25-150
13C2_6:2FTS	N	171	25-150
13C2_8:2FTS		135	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		34	25-150
13C4_PFHpA		102	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		73	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-001**

Description: **MichAve-MH-3_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 0900** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		100	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-002**

Description: **Verlinden-MH-5_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 0920** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/27/2023 2335	BWS	10/27/2023 0818	88543

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.2	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.2	0.68	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.2	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.2	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.2	0.89	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.2	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.2	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.2	0.77	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.2	0.95	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.8**	**J**	**4.1**	**0.42**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.79	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.51	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.73	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**4.1**	**0.61**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.2**	**J**	**4.1**	**0.54**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.48	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**19**		**4.1**	**0.46**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**28**		**4.1**	**0.70**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.0**	**J**	**4.1**	**0.47**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**39**		**4.1**	**0.85**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**27**		**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.64	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**13**		**4.1**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	281	25-150
13C2_6:2FTS	N	157	25-150
13C2_8:2FTS		131	25-150
13C2_PFDoA		103	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		97	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		44	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-002**

Description: **Verlinden-MH-5_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 0920** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		107	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-006**

Description: **Osborn-MH-2-SE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1105** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/31/2023 1545	BWS	10/30/2023 1633	88733

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.6	0.52	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.6	0.71	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.6	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.6	2.2	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.6	0.94	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.6	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.6	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.6	0.81	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.6	1.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.96**	**J**	**4.3**	**0.45**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.3	0.84	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.3	0.54	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.3	0.77	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.3	0.66	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.3	0.64	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.81**	**J**	**4.3**	**0.59**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.3**		**4.3**	**0.65**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.0**	**J**	**4.3**	**0.57**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.3	0.51	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.4**		**4.3**	**0.48**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.5**		**4.3**	**0.74**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.7**	**J**	**4.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**4.3**	**0.89**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.5**		**4.3**	**0.59**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.3	0.65	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.3	0.57	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.3	0.67	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**15**		**4.3**	**2.2**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	200	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		59	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-006**

Description: **Osborn-MH-2-SE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1105** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-007**

Description: **Osborn-MH-2-W_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1115** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/31/2023 1558	BWS	10/30/2023 1633	88733

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	0.68	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	0.90	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	0.77	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	0.96	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**4.1**	**0.43**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.80	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**4.1**	**0.57**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**4.1**	**0.62**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.4**		**4.1**	**0.46**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**4.1**	**0.71**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.1**	**J**	**4.1**	**0.48**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**24**		**4.1**	**0.86**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**10**		**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.65	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**10**		**4.1**	**2.1**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	196	25-150
13C2_6:2FTS		115	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-007**

Description: **Osborn-MH-2-W_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1115** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-008**

Description: **Osborn-MH-3_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1125** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/31/2023 1624	BWS	10/30/2023 1633	88733

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	0.69	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	0.90	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	0.78	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	0.96	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**4.1**	**0.43**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.80	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**4.1**	**0.57**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**4.1**	**0.62**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.64**	**J**	**4.1**	**0.54**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.4**		**4.1**	**0.46**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**12**		**4.1**	**0.71**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.3**	**J**	**4.1**	**0.48**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**25**		**4.1**	**0.86**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.3**		**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.65	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**14**		**4.1**	**2.1**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	206	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-008**

Description: **Osborn-MH-3_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1125** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-009**

Description: **Osborn-CB-2_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1135** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1730	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	0.63	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.7	0.84	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	0.72	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	0.89	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.8**	**0.40**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.74	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.68	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.8**	**0.53**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.8**		**3.8**	**0.57**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.0**	**J**	**3.8**	**0.50**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.3**		**3.8**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.1**		**3.8**	**0.66**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.8**	**0.44**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.8**	**0.79**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.2**		**3.8**	**0.52**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**16**		**3.8**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	231	25-150
13C2_6:2FTS		131	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		110	25-150
13C2_PFTeDA		114	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		59	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-009**

Description: **Osborn-CB-2_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1135** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		102	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-010**

Description: **Osborn-MH-4-E_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1742	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.7	0.84	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	0.72	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	0.90	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.9**	**0.40**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.75	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.57	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.98**	**J**	**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.5**		**3.9**	**0.58**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.57**	**J**	**3.9**	**0.51**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**	**J**	**3.9**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.3**		**3.9**	**0.66**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.9**	**0.45**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**9.5**		**3.9**	**0.80**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.7**	**J**	**3.9**	**0.52**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**10**		**3.9**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	262	25-150
13C2_6:2FTS		148	25-150
13C2_8:2FTS		120	25-150
13C2_PFDoA		111	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		52	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-010**

Description: **Osborn-MH-4-E_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		111	25-150
d3-MeFOSAA		112	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-011**

Description: **Osborn-MH-4_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1755	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	0.66	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	0.87	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	0.75	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	0.93	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**4.0**	**0.41**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.78	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.71	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.59	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.9**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.68**	**J**	**4.0**	**0.53**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.8**	**J**	**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.5**		**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.4**	**J**	**4.0**	**0.46**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**11**		**4.0**	**0.83**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.9**	**J**	**4.0**	**0.54**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**17**		**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	229	25-150
13C2_6:2FTS		131	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		101	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-011**

Description: **Osborn-MH-4_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1210** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-012**

Description: **Osborn-MH-4-NE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1215** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1821	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.9	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.9	0.66	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.9	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.9	0.87	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.9	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.9	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.9	0.74	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.9	0.92	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**J**	**4.0**	**0.41**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.77	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.71	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.59	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.6**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.85**	**J**	**4.0**	**0.52**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.5**		**4.0**	**0.44**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.3**		**4.0**	**0.68**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.7**	**J**	**4.0**	**0.46**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**4.0**	**0.82**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.7**		**4.0**	**0.54**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.59	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.62	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**31**		**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	224	25-150
13C2_6:2FTS		135	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		108	25-150
13C2_PFTeDA		109	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		104	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-012**

Description: **Osborn-MH-4-NE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1215** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-013**

Description: **Osborn-MH-1-SW_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1230** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1833	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	0.65	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.8	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	0.86	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.3**	**J**	**7.8**	**0.74**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	0.91	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.41	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.76	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.70	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.9**	**0.54**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**16**		**3.9**	**0.59**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.0**		**3.9**	**0.51**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**15**		**3.9**	**0.44**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**		**3.9**	**0.67**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**6.2**		**3.9**	**0.45**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**		**3.9**	**0.81**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**16**		**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.61	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**27**		**3.9**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	368	25-150
13C2_6:2FTS	N	202	25-150
13C2_8:2FTS	N	192	25-150
13C2_PFDoA		111	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		34	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		72	25-150
13C6_PFDA		94	25-150
13C7_PFUdA		111	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-013**

Description: **Osborn-MH-1-SW_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1230** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		133	25-150
d3-MeFOSAA		125	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-014**

Description: **Osborn-MH-1-SE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1240** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/01/2023 1846	BWS	10/31/2023 1449	88816

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	0.67	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	0.88	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	0.75	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	0.94	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**4.0**	**0.42**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.78	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.72	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.62	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.2**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.8**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.72**	**J**	**4.0**	**0.53**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.9**	**J**	**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.8**		**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**J**	**4.0**	**0.46**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**12**		**4.0**	**0.83**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.8**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**16**		**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	245	25-150
13C2_6:2FTS		145	25-150
13C2_8:2FTS		112	25-150
13C2_PFDoA		105	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		58	25-150
13C4_PFHpA		111	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		112	25-150

LOQ = Limit of Quantitation
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-014**

Description: **Osborn-MH-1-SE_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1240** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		106	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-015**

Description: **Osborn-MH-1-N_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1245** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/07/2023 2205	BWS	11/03/2023 1042	89091

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	0.65	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.8	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	0.85	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	0.73	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	0.91	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.7**	**J**	**3.9**	**0.40**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.76	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.9**	**0.54**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**3.9**	**0.59**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.4**		**3.9**	**0.51**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**12**		**3.9**	**0.44**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**3.9**	**0.67**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.2**		**3.9**	**0.45**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**		**3.9**	**0.81**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.61	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**18**		**3.9**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	321	25-150
13C2_6:2FTS	N	218	25-150
13C2_8:2FTS		147	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-015**

Description: **Osborn-MH-1-N_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1245** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-016**

Description: **Osborn-MH-1-E_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1250** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/07/2023 2216	BWS	11/03/2023 1042	89091

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	0.66	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	0.87	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	0.75	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	0.93	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	0.41	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.78	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.71	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.59	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.1**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.6**		**4.0**	**0.52**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**12**		**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**14**		**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.4**		**4.0**	**0.46**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**25**		**4.0**	**0.83**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**4.0**	**0.54**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**20**		**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	244	25-150
13C2_6:2FTS	N	193	25-150
13C2_8:2FTS		143	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-016**

Description: **Osborn-MH-1-E_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1250** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-017**

Description: **Stanley-MH-1_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1310** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/07/2023 2248	BWS	11/03/2023 1042	89091

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.0	0.66	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.0	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.0	0.87	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.0	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.0	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.0	0.75	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.0	0.93	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	0.41	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.77	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.71	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.59	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.0**	**J**	**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**4.0**	**0.60**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.6**		**4.0**	**0.52**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**14**		**4.0**	**0.44**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**15**		**4.0**	**0.68**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.9**		**4.0**	**0.46**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**30**		**4.0**	**0.82**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**4.0**	**0.54**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.62	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**22**		**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	289	25-150
13C2_6:2FTS	N	174	25-150
13C2_8:2FTS		119	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		44	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		71	25-150
13C4_PFBA		52	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		94	25-150
13C7_PFUdA		91	25-150

LOQ = Limit of Quantitation
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-017**

Description: **Stanley-MH-1_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1310** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-018**

Description: **P2-MH-2_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1505** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1745	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	0.69	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	0.90	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	0.78	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	0.96	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.2**	**J**	**4.1**	**0.43**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.80	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.4**		**4.1**	**0.57**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.7**		**4.1**	**0.62**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.1**	**J**	**4.1**	**0.54**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.1**		**4.1**	**0.46**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**11**		**4.1**	**0.71**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.9**	**J**	**4.1**	**0.48**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**20**		**4.1**	**0.86**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.5**		**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.65	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**18**		**4.1**	**2.1**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	292	25-150
13C2_6:2FTS	N	221	25-150
13C2_8:2FTS		144	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-018**

Description: **P2-MH-2_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1505** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-019**

Description: **P3-MH-284_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1520** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1828	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.9	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.9	0.65	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.9	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.9	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.9	0.86	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.9	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.9	0.74	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.9	0.92	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.92**	**J**	**3.9**	**0.41**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.76	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.70	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.54	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.9**	**0.59**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.82**	**J**	**3.9**	**0.68**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.9	0.82	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.75**	**J**	**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.62	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.0**		**3.9**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	258	25-150
13C2_6:2FTS	N	157	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		58	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-019**

Description: **P3-MH-284_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1520** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-020**

Description: **P2-MH-W_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1555** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1849	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.8	0.85	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	0.73	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	0.90	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**J**	**3.9**	**0.40**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.75	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.9**	**0.54**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.9**		**3.9**	**0.58**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.82**	**J**	**3.9**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.67	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.4**	**J**	**3.9**	**0.80**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.4**	**J**	**3.9**	**0.53**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.61	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.3**		**3.9**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	195	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		61	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-020**

Description: **P2-MH-W_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1555** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		75	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-021**

Description: **DUP-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1900	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	0.69	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	8.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.3	0.91	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.1**	**J**	**8.3**	**0.78**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	0.97	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	0.43	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.81	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.64	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**4.1**	**0.57**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**4.1**	**0.62**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.7**		**4.1**	**0.54**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**4.1**	**0.46**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**18**		**4.1**	**0.71**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.3**		**4.1**	**0.48**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**31**		**4.1**	**0.86**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**17**		**4.1**	**0.56**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.65	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**28**		**4.1**	**2.1**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	297	25-150
13C2_6:2FTS	N	259	25-150
13C2_8:2FTS	N	185	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		49	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		91	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-021**

Description: **DUP-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-022**

Description: **DUP-02_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1911	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.6	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.6	0.63	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.6	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.6	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.6	0.83	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.6	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.6	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.6	0.71	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.6	0.89	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**3.8**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.74	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.8	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.68	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.58	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.4**	**J**	**3.8**	**0.52**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.2**		**3.8**	**0.57**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.8	0.50	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.63**	**J**	**3.8**	**0.43**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.8	0.65	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.8	0.44	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.8**	**0.79**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.3**	**J**	**3.8**	**0.52**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.50	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.9**		**3.8**	**1.9**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	185	25-150
13C2_6:2FTS	N	151	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		74	25-150
13C4_PFBA		58	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-022**

Description: **DUP-02_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		115	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-023**

Description: **EB-01** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1921	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	0.68	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.1	0.89	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	0.76	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	0.95	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	0.42	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.79	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.51	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.72	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.60	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.1	0.56	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	0.53	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.48	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.1	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.1	0.70	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.1	0.47	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.1	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.64	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.1	2.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	25-150
13C2_6:2FTS	N	168	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		103	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-023**

Description: **EB-01** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		115	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-024**

Description: **FB-01** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/08/2023 1932	BWS	11/06/2023 1021	89244

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.9	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.9	0.65	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.9	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.9	0.86	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.9	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.9	0.48	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.9	0.74	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.9	0.92	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.9	0.41	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.77	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.70	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.9	0.54	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.68	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.9	0.82	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.9	0.54	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.52	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.62	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.9	2.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	25-150
13C2_6:2FTS		131	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ26022-024**

Description: **FB-01** Matrix: **Aqueous**

Date Sampled: **10/24/2023** Project Name: **RACER Lansing PFAS**

Date Received: **10/26/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: YQ88543-001
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	10/27/2023 2140
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	10/27/2023 2140
8:2 FTS	ND		1	8.0	1.6	ng/L	10/27/2023 2140
6:2 FTS	**4.0**	**J**	**1**	**8.0**	**2.0**	**ng/L**	**10/27/2023 2140**
4:2 FTS	ND		1	8.0	0.87	ng/L	10/27/2023 2140
GenX	ND		1	8.0	2.1	ng/L	10/27/2023 2140
ADONA	ND		1	8.0	0.48	ng/L	10/27/2023 2140
EtFOSAA	ND		1	8.0	0.75	ng/L	10/27/2023 2140
MeFOSAA	ND		1	8.0	0.93	ng/L	10/27/2023 2140
PFBS	ND		1	4.0	0.41	ng/L	10/27/2023 2140
PFDS	ND		1	4.0	0.78	ng/L	10/27/2023 2140
PFHpS	ND		1	4.0	0.50	ng/L	10/27/2023 2140
PFNS	ND		1	4.0	0.71	ng/L	10/27/2023 2140
PFOSA	ND		1	4.0	0.61	ng/L	10/27/2023 2140
PFPeS	ND		1	4.0	0.59	ng/L	10/27/2023 2140
PFHxS	ND		1	4.0	0.55	ng/L	10/27/2023 2140
PFBA	ND		1	4.0	0.60	ng/L	10/27/2023 2140
PFDA	ND		1	4.0	0.52	ng/L	10/27/2023 2140
PFDoA	ND		1	4.0	0.47	ng/L	10/27/2023 2140
PFHpA	ND		1	4.0	0.45	ng/L	10/27/2023 2140
PFHxA	ND		1	4.0	0.69	ng/L	10/27/2023 2140
PFNA	ND		1	4.0	0.46	ng/L	10/27/2023 2140
PFOA	ND		1	4.0	0.83	ng/L	10/27/2023 2140
PFPeA	ND		1	4.0	0.54	ng/L	10/27/2023 2140
PFTeDA	ND		1	4.0	0.60	ng/L	10/27/2023 2140
PFTrDA	ND		1	4.0	0.53	ng/L	10/27/2023 2140
PFUdA	ND		1	4.0	0.63	ng/L	10/27/2023 2140
PFOS	ND		1	4.0	2.0	ng/L	10/27/2023 2140

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		112	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		104	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ88543-001
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		105	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		103	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88543-002
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	101	50-150	10/27/2023 2153
11Cl-PF3OUdS	15	15		1	98	50-150	10/27/2023 2153
8:2 FTS	15	15		1	98	50-150	10/27/2023 2153
6:2 FTS	15	15		1	98	50-150	10/27/2023 2153
4:2 FTS	15	15		1	98	50-150	10/27/2023 2153
GenX	32	34		1	105	50-150	10/27/2023 2153
ADONA	15	16		1	103	50-150	10/27/2023 2153
EtFOSAA	16	16		1	102	50-150	10/27/2023 2153
MeFOSAA	16	17		1	104	50-150	10/27/2023 2153
PFBS	14	14		1	98	50-150	10/27/2023 2153
PFDS	15	15		1	96	50-150	10/27/2023 2153
PFHpS	15	15		1	96	50-150	10/27/2023 2153
PFNS	15	15		1	97	50-150	10/27/2023 2153
PFOSA	16	17		1	105	50-150	10/27/2023 2153
PFPeS	15	15		1	100	50-150	10/27/2023 2153
PFHxS	15	15		1	102	50-150	10/27/2023 2153
PFBA	16	15		1	94	50-150	10/27/2023 2153
PFDA	16	16		1	98	50-150	10/27/2023 2153
PFDoA	16	17		1	103	50-150	10/27/2023 2153
PFHpA	16	16		1	98	50-150	10/27/2023 2153
PFHxA	16	16		1	99	50-150	10/27/2023 2153
PFNA	16	16		1	100	50-150	10/27/2023 2153
PFOA	16	16		1	100	50-150	10/27/2023 2153
PFPeA	16	16		1	98	50-150	10/27/2023 2153
PFTeDA	16	16		1	98	50-150	10/27/2023 2153
PFTrDA	16	15		1	96	50-150	10/27/2023 2153
PFUdA	16	16		1	98	50-150	10/27/2023 2153
PFOS	15	15		1	100	50-150	10/27/2023 2153

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		101	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		111	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		101	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88543-002
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		106	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-001MS
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	15		1	104	50-150	10/27/2023 2310
11Cl-PF3OUdS	ND	15	15		1	101	50-150	10/27/2023 2310
8:2 FTS	ND	15	17		1	113	50-150	10/27/2023 2310
6:2 FTS	ND	15	16		1	106	50-150	10/27/2023 2310
4:2 FTS	ND	15	15		1	104	50-150	10/27/2023 2310
GenX	ND	32	33		1	105	50-150	10/27/2023 2310
ADONA	ND	15	15		1	104	50-150	10/27/2023 2310
EtFOSAA	ND	16	18		1	116	50-150	10/27/2023 2310
MeFOSAA	ND	16	17		1	110	50-150	10/27/2023 2310
PFBS	2.5	14	16		1	100	50-150	10/27/2023 2310
PFDS	ND	15	15		1	101	50-150	10/27/2023 2310
PFHpS	ND	15	15		1	101	50-150	10/27/2023 2310
PFNS	ND	15	15		1	101	50-150	10/27/2023 2310
PFOSA	ND	16	17		1	105	50-150	10/27/2023 2310
PFPeS	ND	15	16		1	107	50-150	10/27/2023 2310
PFHxS	2.6	14	17		1	101	50-150	10/27/2023 2310
PFBA	6.2	16	23		1	104	50-150	10/27/2023 2310
PFDA	ND	16	16		1	102	50-150	10/27/2023 2310
PFDoA	ND	16	16		1	100	50-150	10/27/2023 2310
PFHpA	1.7	16	17		1	98	50-150	10/27/2023 2310
PFHxA	2.1	16	19		1	109	50-150	10/27/2023 2310
PFNA	ND	16	16		1	102	50-150	10/27/2023 2310
PFOA	4.5	16	22		1	109	50-150	10/27/2023 2310
PFPeA	2.6	16	20		1	108	50-150	10/27/2023 2310
PFTeDA	ND	16	16		1	103	50-150	10/27/2023 2310
PFTrDA	ND	16	16		1	100	50-150	10/27/2023 2310
PFUdA	ND	16	16		1	102	50-150	10/27/2023 2310
PFOS	3.7	15	19		1	104	50-150	10/27/2023 2310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	320	25-150
13C2_6:2FTS	N	183	25-150
13C2_8:2FTS		149	25-150
13C2_PFDoA		105	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		32	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		73	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-001MS
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		106	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		100	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		108	25-150
d3-MeFOSAA		111	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YJ26022-001MD
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	14	15		1	105	3.7	50-150	30	10/27/2023 2323
11Cl-PF3OUdS	ND	14	12		1	85	20	50-150	30	10/27/2023 2323
8:2 FTS	ND	15	15		1	105	11	50-150	30	10/27/2023 2323
6:2 FTS	ND	14	18		1	122	10	50-150	30	10/27/2023 2323
4:2 FTS	ND	14	15		1	109	0.082	50-150	30	10/27/2023 2323
GenX	ND	30	33		1	109	0.029	50-150	30	10/27/2023 2323
ADONA	ND	14	15		1	108	0.25	50-150	30	10/27/2023 2323
EtFOSAA	ND	15	17		1	112	7.9	50-150	30	10/27/2023 2323
MeFOSAA	ND	15	16		1	105	8.4	50-150	30	10/27/2023 2323
PFBS	2.5	13	16		1	100	3.0	50-150	30	10/27/2023 2323
PFDS	ND	15	12		1	85	21	50-150	30	10/27/2023 2323
PFHpS	ND	14	14		1	98	6.6	50-150	30	10/27/2023 2323
PFNS	ND	15	14		1	95	9.7	50-150	30	10/27/2023 2323
PFOSA	ND	15	17		1	111	1.5	50-150	30	10/27/2023 2323
PFPeS	ND	14	15		1	104	7.1	50-150	30	10/27/2023 2323
PFHxS	2.6	14	15		1	91	12	50-150	30	10/27/2023 2323
PFBA	6.2	15	21		1	97	7.4	50-150	30	10/27/2023 2323
PFDA	ND	15	15		1	102	4.0	50-150	30	10/27/2023 2323
PFDoA	ND	15	16		1	108	3.6	50-150	30	10/27/2023 2323
PFHpA	1.7	15	16		1	97	4.8	50-150	30	10/27/2023 2323
PFHxA	2.1	15	17		1	98	13	50-150	30	10/27/2023 2323
PFNA	ND	15	16		1	105	1.6	50-150	30	10/27/2023 2323
PFOA	4.5	15	19		1	96	13	50-150	30	10/27/2023 2323
PFPeA	2.6	15	17		1	92	17	50-150	30	10/27/2023 2323
PFTeDA	ND	15	15		1	97	9.7	50-150	30	10/27/2023 2323
PFTrDA	ND	15	14		1	95	8.6	50-150	30	10/27/2023 2323
PFUdA	ND	15	16		1	103	3.2	50-150	30	10/27/2023 2323
PFOS	3.7	14	17		1	96	9.5	50-150	30	10/27/2023 2323

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		142	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		71	25-150
13C2_PFDoA		51	25-150
13C2_PFTeDA		44	25-150
13C3_PFBS		60	25-150
13C3_PFHxS		63	25-150
13C3-HFPO-DA		59	25-150
13C4_PFBA		30	25-150
13C4_PFHpA		66	25-150
13C5_PFHxA		65	25-150
13C5_PFPeA		55	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MSD

Sample ID: YJ26022-001MD
Batch: 88543
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/27/2023 0818

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		63	25-150
13C7_PFUdA		59	25-150
13C8_PFOA		64	25-150
13C8_PFOS		58	25-150
13C8_PFOSA		59	10-150
13C9_PFNA		60	25-150
d5-EtFOSAA		57	25-150
d3-MeFOSAA		59	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ88733-001
Batch: 88733
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	10/31/2023 1402
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	10/31/2023 1402
8:2 FTS	ND		1	8.0	1.6	ng/L	10/31/2023 1402
6:2 FTS	ND		1	8.0	2.0	ng/L	10/31/2023 1402
4:2 FTS	ND		1	8.0	0.87	ng/L	10/31/2023 1402
GenX	ND		1	8.0	2.1	ng/L	10/31/2023 1402
ADONA	ND		1	8.0	0.48	ng/L	10/31/2023 1402
EtFOSAA	ND		1	8.0	0.75	ng/L	10/31/2023 1402
MeFOSAA	ND		1	8.0	0.93	ng/L	10/31/2023 1402
PFBS	ND		1	4.0	0.41	ng/L	10/31/2023 1402
PFDS	ND		1	4.0	0.78	ng/L	10/31/2023 1402
PFHpS	ND		1	4.0	0.50	ng/L	10/31/2023 1402
PFNS	ND		1	4.0	0.71	ng/L	10/31/2023 1402
PFOSA	ND		1	4.0	0.61	ng/L	10/31/2023 1402
PFPeS	ND		1	4.0	0.59	ng/L	10/31/2023 1402
PFHxS	ND		1	4.0	0.55	ng/L	10/31/2023 1402
PFBA	ND		1	4.0	0.60	ng/L	10/31/2023 1402
PFDA	ND		1	4.0	0.52	ng/L	10/31/2023 1402
PFDoA	ND		1	4.0	0.47	ng/L	10/31/2023 1402
PFHpA	ND		1	4.0	0.45	ng/L	10/31/2023 1402
PFHxA	ND		1	4.0	0.69	ng/L	10/31/2023 1402
PFNA	ND		1	4.0	0.46	ng/L	10/31/2023 1402
PFOA	ND		1	4.0	0.83	ng/L	10/31/2023 1402
PFPeA	ND		1	4.0	0.54	ng/L	10/31/2023 1402
PFTeDA	ND		1	4.0	0.60	ng/L	10/31/2023 1402
PFTrDA	ND		1	4.0	0.53	ng/L	10/31/2023 1402
PFUdA	ND		1	4.0	0.63	ng/L	10/31/2023 1402
PFOS	ND		1	4.0	2.0	ng/L	10/31/2023 1402

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ88733-001
Batch: 88733
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		93	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		99	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88733-002
Batch: 88733
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	106	50-150	10/31/2023 1415
11Cl-PF3OUdS	15	15		1	102	50-150	10/31/2023 1415
8:2 FTS	15	16		1	106	50-150	10/31/2023 1415
6:2 FTS	15	16		1	104	50-150	10/31/2023 1415
4:2 FTS	15	15		1	102	50-150	10/31/2023 1415
GenX	32	36		1	112	50-150	10/31/2023 1415
ADONA	15	17		1	112	50-150	10/31/2023 1415
EtFOSAA	16	18		1	113	50-150	10/31/2023 1415
MeFOSAA	16	16		1	103	50-150	10/31/2023 1415
PFBS	14	15		1	104	50-150	10/31/2023 1415
PFDS	15	16		1	105	50-150	10/31/2023 1415
PFHpS	15	16		1	104	50-150	10/31/2023 1415
PFNS	15	16		1	103	50-150	10/31/2023 1415
PFOSA	16	17		1	109	50-150	10/31/2023 1415
PFPeS	15	15		1	103	50-150	10/31/2023 1415
PFHxS	15	16		1	112	50-150	10/31/2023 1415
PFBA	16	17		1	104	50-150	10/31/2023 1415
PFDA	16	17		1	105	50-150	10/31/2023 1415
PFDoA	16	16		1	98	50-150	10/31/2023 1415
PFHpA	16	17		1	107	50-150	10/31/2023 1415
PFHxA	16	16		1	103	50-150	10/31/2023 1415
PFNA	16	17		1	105	50-150	10/31/2023 1415
PFOA	16	17		1	108	50-150	10/31/2023 1415
PFPeA	16	17		1	104	50-150	10/31/2023 1415
PFTeDA	16	16		1	102	50-150	10/31/2023 1415
PFTrDA	16	16		1	98	50-150	10/31/2023 1415
PFUdA	16	16		1	103	50-150	10/31/2023 1415
PFOS	15	16		1	105	50-150	10/31/2023 1415

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		88	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88733-002
Batch: 88733
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		92	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-007DU
Batch: 88733
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	10/31/2023 1611
11Cl-PF3OUdS	ND	ND		1	0.00	20	10/31/2023 1611
8:2 FTS	ND	ND		1	0.00	20	10/31/2023 1611
6:2 FTS	ND	ND		1	0.00	20	10/31/2023 1611
4:2 FTS	ND	ND		1	0.00	20	10/31/2023 1611
GenX	ND	ND		1	0.00	20	10/31/2023 1611
ADONA	ND	ND		1	0.00	20	10/31/2023 1611
EtFOSAA	ND	ND		1	0.00	20	10/31/2023 1611
MeFOSAA	ND	ND		1	0.00	20	10/31/2023 1611
PFBS	1.1	1.0	J	1	4.1	20	10/31/2023 1611
PFDS	ND	ND		1	0.00	20	10/31/2023 1611
PFHpS	ND	ND		1	0.00	20	10/31/2023 1611
PFNS	ND	ND		1	0.00	20	10/31/2023 1611
PFOSA	ND	ND		1	0.00	20	10/31/2023 1611
PFPeS	ND	ND		1	0.00	20	10/31/2023 1611
PFHxS	1.1	0.89	J,+	1	22	20	10/31/2023 1611
PFBA	12	12		1	0.67	20	10/31/2023 1611
PFDA	ND	ND		1	0.00	20	10/31/2023 1611
PFDoA	ND	ND		1	0.00	20	10/31/2023 1611
PFHpA	8.4	8.5		1	0.88	20	10/31/2023 1611
PFHxA	15	14		1	3.6	20	10/31/2023 1611
PFNA	2.1	1.8	J	1	12	20	10/31/2023 1611
PFOA	24	23		1	5.5	20	10/31/2023 1611
PFPeA	10	10		1	2.0	20	10/31/2023 1611
PFTeDA	ND	ND		1	0.00	20	10/31/2023 1611
PFTrDA	ND	ND		1	0.00	20	10/31/2023 1611
PFUdA	ND	ND		1	0.00	20	10/31/2023 1611
PFOS	10	9.5		1	5.3	20	10/31/2023 1611

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	203	25-150
13C2_6:2FTS		118	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		102	25-150
13C5_PFPeA		87	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-007DU
Batch: 88733
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/30/2023 1633

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		93	25-150
13C8_PFOA		95	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ88816-001
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/01/2023 1613
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/01/2023 1613
8:2 FTS	ND		1	8.0	1.6	ng/L	11/01/2023 1613
6:2 FTS	ND		1	8.0	2.0	ng/L	11/01/2023 1613
4:2 FTS	ND		1	8.0	0.87	ng/L	11/01/2023 1613
GenX	ND		1	8.0	2.1	ng/L	11/01/2023 1613
ADONA	ND		1	8.0	0.48	ng/L	11/01/2023 1613
EtFOSAA	ND		1	8.0	0.75	ng/L	11/01/2023 1613
MeFOSAA	ND		1	8.0	0.93	ng/L	11/01/2023 1613
PFBS	ND		1	4.0	0.41	ng/L	11/01/2023 1613
PFDS	ND		1	4.0	0.78	ng/L	11/01/2023 1613
PFHpS	ND		1	4.0	0.50	ng/L	11/01/2023 1613
PFNS	ND		1	4.0	0.71	ng/L	11/01/2023 1613
PFOSA	ND		1	4.0	0.61	ng/L	11/01/2023 1613
PFPeS	ND		1	4.0	0.59	ng/L	11/01/2023 1613
PFHxS	ND		1	4.0	0.55	ng/L	11/01/2023 1613
PFBA	ND		1	4.0	0.60	ng/L	11/01/2023 1613
PFDA	ND		1	4.0	0.52	ng/L	11/01/2023 1613
PFDoA	ND		1	4.0	0.47	ng/L	11/01/2023 1613
PFHpA	ND		1	4.0	0.45	ng/L	11/01/2023 1613
PFHxA	ND		1	4.0	0.69	ng/L	11/01/2023 1613
PFNA	ND		1	4.0	0.46	ng/L	11/01/2023 1613
PFOA	ND		1	4.0	0.83	ng/L	11/01/2023 1613
PFPeA	ND		1	4.0	0.54	ng/L	11/01/2023 1613
PFTeDA	ND		1	4.0	0.60	ng/L	11/01/2023 1613
PFTrDA	ND		1	4.0	0.53	ng/L	11/01/2023 1613
PFUdA	ND		1	4.0	0.63	ng/L	11/01/2023 1613
PFOS	ND		1	4.0	2.0	ng/L	11/01/2023 1613

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		105	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		102	25-150
13C4_PFHpA		102	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		100	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ88816-001
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		101	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		105	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88816-002
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	107	50-150	11/01/2023 1625
11Cl-PF3OUdS	15	16		1	104	50-150	11/01/2023 1625
8:2 FTS	15	17		1	114	50-150	11/01/2023 1625
6:2 FTS	15	16		1	106	50-150	11/01/2023 1625
4:2 FTS	15	16		1	106	50-150	11/01/2023 1625
GenX	32	37		1	116	50-150	11/01/2023 1625
ADONA	15	17		1	113	50-150	11/01/2023 1625
EtFOSAA	16	18		1	112	50-150	11/01/2023 1625
MeFOSAA	16	19		1	120	50-150	11/01/2023 1625
PFBS	14	16		1	110	50-150	11/01/2023 1625
PFDS	15	17		1	109	50-150	11/01/2023 1625
PFHpS	15	16		1	108	50-150	11/01/2023 1625
PFNS	15	16		1	106	50-150	11/01/2023 1625
PFOSA	16	18		1	113	50-150	11/01/2023 1625
PFPeS	15	17		1	112	50-150	11/01/2023 1625
PFHxS	15	16		1	107	50-150	11/01/2023 1625
PFBA	16	17		1	107	50-150	11/01/2023 1625
PFDA	16	18		1	111	50-150	11/01/2023 1625
PFDoA	16	19		1	116	50-150	11/01/2023 1625
PFHpA	16	18		1	114	50-150	11/01/2023 1625
PFHxA	16	17		1	109	50-150	11/01/2023 1625
PFNA	16	18		1	110	50-150	11/01/2023 1625
PFOA	16	17		1	109	50-150	11/01/2023 1625
PFPeA	16	18		1	111	50-150	11/01/2023 1625
PFTeDA	16	16		1	101	50-150	11/01/2023 1625
PFTrDA	16	16		1	102	50-150	11/01/2023 1625
PFUdA	16	17		1	105	50-150	11/01/2023 1625
PFOS	15	16		1	110	50-150	11/01/2023 1625

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		97	25-150
13C4_PFBA		103	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ88816-002
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		101	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		103	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-011MS
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	16		1	106	50-150	11/01/2023 1808
11Cl-PF3OUdS	ND	15	15		1	101	50-150	11/01/2023 1808
8:2 FTS	ND	15	17		1	108	50-150	11/01/2023 1808
6:2 FTS	ND	15	16		1	105	50-150	11/01/2023 1808
4:2 FTS	ND	15	16		1	105	50-150	11/01/2023 1808
GenX	ND	32	38		1	118	50-150	11/01/2023 1808
ADONA	ND	15	17		1	111	50-150	11/01/2023 1808
EtFOSAA	ND	16	19		1	117	50-150	11/01/2023 1808
MeFOSAA	ND	16	18		1	111	50-150	11/01/2023 1808
PFBS	1.1	14	17		1	110	50-150	11/01/2023 1808
PFDS	ND	16	17		1	108	50-150	11/01/2023 1808
PFHpS	ND	15	16		1	104	50-150	11/01/2023 1808
PFNS	ND	16	16		1	106	50-150	11/01/2023 1808
PFOSA	ND	16	18		1	111	50-150	11/01/2023 1808
PFPeS	ND	15	17		1	115	50-150	11/01/2023 1808
PFHxS	1.1	15	16		1	105	50-150	11/01/2023 1808
PFBA	6.9	16	24		1	106	50-150	11/01/2023 1808
PFDA	0.68	16	18		1	110	50-150	11/01/2023 1808
PFDoA	ND	16	17		1	103	50-150	11/01/2023 1808
PFHpA	3.8	16	21		1	106	50-150	11/01/2023 1808
PFHxA	5.5	16	23		1	110	50-150	11/01/2023 1808
PFNA	1.4	16	19		1	107	50-150	11/01/2023 1808
PFOA	11	16	29		1	108	50-150	11/01/2023 1808
PFPeA	3.9	16	21		1	104	50-150	11/01/2023 1808
PFTeDA	ND	16	17		1	106	50-150	11/01/2023 1808
PFTrDA	ND	16	17		1	103	50-150	11/01/2023 1808
PFUdA	ND	16	17		1	106	50-150	11/01/2023 1808
PFOS	17	15	33		1	109	50-150	11/01/2023 1808

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	237	25-150
13C2_6:2FTS		138	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		107	25-150
13C2_PFTeDA		109	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		107	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		111	25-150
13C5_PFHxA		110	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-011MS
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	25-150
13C7_PFUdA		108	25-150
13C8_PFOA		105	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		103	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-014DU
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	11/01/2023 1859
11Cl-PF3OUdS	ND	ND		1	0.00	20	11/01/2023 1859
8:2 FTS	ND	ND		1	0.00	20	11/01/2023 1859
6:2 FTS	ND	ND		1	0.00	20	11/01/2023 1859
4:2 FTS	ND	ND		1	0.00	20	11/01/2023 1859
GenX	ND	ND		1	0.00	20	11/01/2023 1859
ADONA	ND	ND		1	0.00	20	11/01/2023 1859
EtFOSAA	ND	ND		1	0.00	20	11/01/2023 1859
MeFOSAA	ND	ND		1	0.00	20	11/01/2023 1859
PFBS	1.1	1.2	J	1	8.8	20	11/01/2023 1859
PFDS	ND	ND		1	0.00	20	11/01/2023 1859
PFHpS	ND	ND		1	0.00	20	11/01/2023 1859
PFNS	ND	ND		1	0.00	20	11/01/2023 1859
PFOSA	ND	ND		1	0.00	20	11/01/2023 1859
PFPeS	ND	ND		1	0.00	20	11/01/2023 1859
PFHxS	1.2	1.2	J	1	2.1	20	11/01/2023 1859
PFBA	6.8	6.8		1	0.27	20	11/01/2023 1859
PFDA	0.72	0.71	J	1	1.4	20	11/01/2023 1859
PFDoA	ND	ND		1	0.00	20	11/01/2023 1859
PFHpA	3.9	3.7		1	4.6	20	11/01/2023 1859
PFHxA	5.8	5.7		1	1.5	20	11/01/2023 1859
PFNA	1.5	1.5	J	1	2.3	20	11/01/2023 1859
PFOA	12	12		1	2.3	20	11/01/2023 1859
PFPeA	3.8	3.5	J	1	8.0	20	11/01/2023 1859
PFTeDA	ND	ND		1	0.00	20	11/01/2023 1859
PFTrDA	ND	ND		1	0.00	20	11/01/2023 1859
PFUdA	ND	ND		1	0.00	20	11/01/2023 1859
PFOS	16	17		1	4.8	20	11/01/2023 1859

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	231	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-014DU
Batch: 88816
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 10/31/2023 1449

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		95	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		97	25-150
13C8_PFOS		93	25-150
13C8_PFOSA		91	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		98	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89091-001
Batch: 89091
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/03/2023 1042

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/07/2023 2101
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/07/2023 2101
8:2 FTS	ND		1	8.0	1.6	ng/L	11/07/2023 2101
6:2 FTS	**3.2**	**J**	**1**	**8.0**	**2.0**	**ng/L**	**11/07/2023 2101**
4:2 FTS	ND		1	8.0	0.87	ng/L	11/07/2023 2101
GenX	ND		1	8.0	2.1	ng/L	11/07/2023 2101
ADONA	ND		1	8.0	0.48	ng/L	11/07/2023 2101
EtFOSAA	ND		1	8.0	0.75	ng/L	11/07/2023 2101
MeFOSAA	ND		1	8.0	0.93	ng/L	11/07/2023 2101
PFBS	ND		1	4.0	0.41	ng/L	11/07/2023 2101
PFDS	ND		1	4.0	0.78	ng/L	11/07/2023 2101
PFHpS	ND		1	4.0	0.50	ng/L	11/07/2023 2101
PFNS	ND		1	4.0	0.71	ng/L	11/07/2023 2101
PFOSA	ND		1	4.0	0.61	ng/L	11/07/2023 2101
PFPeS	ND		1	4.0	0.59	ng/L	11/07/2023 2101
PFHxS	ND		1	4.0	0.55	ng/L	11/07/2023 2101
PFBA	ND		1	4.0	0.60	ng/L	11/07/2023 2101
PFDA	ND		1	4.0	0.52	ng/L	11/07/2023 2101
PFDoA	ND		1	4.0	0.47	ng/L	11/07/2023 2101
PFHpA	ND		1	4.0	0.45	ng/L	11/07/2023 2101
PFHxA	ND		1	4.0	0.69	ng/L	11/07/2023 2101
PFNA	ND		1	4.0	0.46	ng/L	11/07/2023 2101
PFOA	ND		1	4.0	0.83	ng/L	11/07/2023 2101
PFPeA	ND		1	4.0	0.54	ng/L	11/07/2023 2101
PFTeDA	ND		1	4.0	0.60	ng/L	11/07/2023 2101
PFTrDA	ND		1	4.0	0.53	ng/L	11/07/2023 2101
PFUdA	ND		1	4.0	0.63	ng/L	11/07/2023 2101
PFOS	ND		1	4.0	2.0	ng/L	11/07/2023 2101

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		60	25-150
13C3_PFBS		95	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89091-001
Batch: 89091
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/03/2023 1042

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		84	25-150
13C8_PFOA		102	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89091-002
Batch: 89091
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/03/2023 1042

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	91	50-150	11/07/2023 2112
11Cl-PF3OUdS	15	14		1	91	50-150	11/07/2023 2112
8:2 FTS	15	16		1	103	50-150	11/07/2023 2112
6:2 FTS	15	16		1	109	50-150	11/07/2023 2112
4:2 FTS	15	12		1	78	50-150	11/07/2023 2112
GenX	32	31		1	96	50-150	11/07/2023 2112
ADONA	15	14		1	93	50-150	11/07/2023 2112
EtFOSAA	16	15		1	97	50-150	11/07/2023 2112
MeFOSAA	16	15		1	96	50-150	11/07/2023 2112
PFBS	14	12		1	84	50-150	11/07/2023 2112
PFDS	15	13		1	87	50-150	11/07/2023 2112
PFHpS	15	13		1	85	50-150	11/07/2023 2112
PFNS	15	14		1	93	50-150	11/07/2023 2112
PFOSA	16	17		1	105	50-150	11/07/2023 2112
PFPeS	15	14		1	95	50-150	11/07/2023 2112
PFHxS	15	14		1	98	50-150	11/07/2023 2112
PFBA	16	15		1	96	50-150	11/07/2023 2112
PFDA	16	14		1	86	50-150	11/07/2023 2112
PFDoA	16	16		1	97	50-150	11/07/2023 2112
PFHpA	16	14		1	88	50-150	11/07/2023 2112
PFHxA	16	15		1	91	50-150	11/07/2023 2112
PFNA	16	16		1	102	50-150	11/07/2023 2112
PFOA	16	16		1	100	50-150	11/07/2023 2112
PFPeA	16	15		1	92	50-150	11/07/2023 2112
PFTeDA	16	16		1	97	50-150	11/07/2023 2112
PFTrDA	16	14		1	89	50-150	11/07/2023 2112
PFUdA	16	14		1	90	50-150	11/07/2023 2112
PFOS	15	16		1	108	50-150	11/07/2023 2112

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		91	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89091-002
Batch: 89091
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/03/2023 1042

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		94	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89244-001
Batch: 89244
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/08/2023 1724
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/08/2023 1724
8:2 FTS	ND		1	8.0	1.6	ng/L	11/08/2023 1724
6:2 FTS	ND		1	8.0	2.0	ng/L	11/08/2023 1724
4:2 FTS	ND		1	8.0	0.87	ng/L	11/08/2023 1724
GenX	ND		1	8.0	2.1	ng/L	11/08/2023 1724
ADONA	ND		1	8.0	0.48	ng/L	11/08/2023 1724
EtFOSAA	ND		1	8.0	0.75	ng/L	11/08/2023 1724
MeFOSAA	ND		1	8.0	0.93	ng/L	11/08/2023 1724
PFBS	ND		1	4.0	0.41	ng/L	11/08/2023 1724
PFDS	ND		1	4.0	0.78	ng/L	11/08/2023 1724
PFHpS	ND		1	4.0	0.50	ng/L	11/08/2023 1724
PFNS	ND		1	4.0	0.71	ng/L	11/08/2023 1724
PFOSA	ND		1	4.0	0.61	ng/L	11/08/2023 1724
PFPeS	ND		1	4.0	0.59	ng/L	11/08/2023 1724
PFHxS	ND		1	4.0	0.55	ng/L	11/08/2023 1724
PFBA	ND		1	4.0	0.60	ng/L	11/08/2023 1724
PFDA	ND		1	4.0	0.52	ng/L	11/08/2023 1724
PFDoA	ND		1	4.0	0.47	ng/L	11/08/2023 1724
PFHpA	ND		1	4.0	0.45	ng/L	11/08/2023 1724
PFHxA	ND		1	4.0	0.69	ng/L	11/08/2023 1724
PFNA	ND		1	4.0	0.46	ng/L	11/08/2023 1724
PFOA	ND		1	4.0	0.83	ng/L	11/08/2023 1724
PFPeA	ND		1	4.0	0.54	ng/L	11/08/2023 1724
PFTeDA	ND		1	4.0	0.60	ng/L	11/08/2023 1724
PFTrDA	ND		1	4.0	0.53	ng/L	11/08/2023 1724
PFUdA	ND		1	4.0	0.63	ng/L	11/08/2023 1724
PFOS	ND		1	4.0	2.0	ng/L	11/08/2023 1724

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		54	25-150
13C2_6:2FTS		52	25-150
13C2_8:2FTS		55	25-150
13C2_PFDoA		51	25-150
13C2_PFTeDA		45	25-150
13C3_PFBS		55	25-150
13C3_PFHxS		62	25-150
13C3-HFPO-DA		56	25-150
13C4_PFBA		59	25-150
13C4_PFHpA		61	25-150
13C5_PFHxA		55	25-150
13C5_PFPeA		57	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: YQ89244-001
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		57	25-150
13C7_PFUdA		55	25-150
13C8_PFOA		61	25-150
13C8_PFOS		55	25-150
13C8_PFOSA		54	10-150
13C9_PFNA		58	25-150
d5-EtFOSAA		53	25-150
d3-MeFOSAA		51	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89244-002
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	92	50-150	11/08/2023 1735
11Cl-PF3OUdS	15	14		1	90	50-150	11/08/2023 1735
8:2 FTS	15	12		1	79	50-150	11/08/2023 1735
6:2 FTS	15	14		1	91	50-150	11/08/2023 1735
4:2 FTS	15	15		1	100	50-150	11/08/2023 1735
GenX	32	35		1	111	50-150	11/08/2023 1735
ADONA	15	16		1	104	50-150	11/08/2023 1735
EtFOSAA	16	16		1	101	50-150	11/08/2023 1735
MeFOSAA	16	17		1	103	50-150	11/08/2023 1735
PFBS	14	13		1	93	50-150	11/08/2023 1735
PFDS	15	14		1	91	50-150	11/08/2023 1735
PFHpS	15	16		1	102	50-150	11/08/2023 1735
PFNS	15	13		1	85	50-150	11/08/2023 1735
PFOSA	16	17		1	106	50-150	11/08/2023 1735
PFPeS	15	13		1	86	50-150	11/08/2023 1735
PFHxS	15	15		1	103	50-150	11/08/2023 1735
PFBA	16	15		1	95	50-150	11/08/2023 1735
PFDA	16	18		1	110	50-150	11/08/2023 1735
PFDoA	16	15		1	95	50-150	11/08/2023 1735
PFHpA	16	16		1	102	50-150	11/08/2023 1735
PFHxA	16	15		1	97	50-150	11/08/2023 1735
PFNA	16	17		1	105	50-150	11/08/2023 1735
PFOA	16	16		1	98	50-150	11/08/2023 1735
PFPeA	16	16		1	100	50-150	11/08/2023 1735
PFTeDA	16	17		1	105	50-150	11/08/2023 1735
PFTrDA	16	14		1	90	50-150	11/08/2023 1735
PFUdA	16	15		1	95	50-150	11/08/2023 1735
PFOS	15	15		1	99	50-150	11/08/2023 1735

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		96	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		101	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: YQ89244-002
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		109	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-018DU
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	11/08/2023 1756
11Cl-PF3OUdS	ND	ND		1	0.00	20	11/08/2023 1756
8:2 FTS	ND	ND		1	0.00	20	11/08/2023 1756
6:2 FTS	ND	ND		1	0.00	20	11/08/2023 1756
4:2 FTS	ND	ND		1	0.00	20	11/08/2023 1756
GenX	ND	ND		1	0.00	20	11/08/2023 1756
ADONA	ND	ND		1	0.00	20	11/08/2023 1756
EtFOSAA	ND	ND		1	0.00	20	11/08/2023 1756
MeFOSAA	ND	ND		1	0.00	20	11/08/2023 1756
PFBS	2.2	2.1	J	1	6.9	20	11/08/2023 1756
PFDS	ND	ND		1	0.00	20	11/08/2023 1756
PFHpS	ND	ND		1	0.00	20	11/08/2023 1756
PFNS	ND	ND		1	0.00	20	11/08/2023 1756
PFOSA	ND	ND		1	0.00	20	11/08/2023 1756
PFPeS	ND	ND		1	0.00	20	11/08/2023 1756
PFHxS	4.4	5.3		1	17	20	11/08/2023 1756
PFBA	9.7	9.1		1	6.6	20	11/08/2023 1756
PFDA	2.1	2.6	J	1	19	20	11/08/2023 1756
PFDoA	ND	ND		1	0.00	20	11/08/2023 1756
PFHpA	9.1	8.9		1	2.1	20	11/08/2023 1756
PFHxA	11	11		1	3.3	20	11/08/2023 1756
PFNA	2.9	2.4	J	1	19	20	11/08/2023 1756
PFOA	20	18		1	9.7	20	11/08/2023 1756
PFPeA	8.5	9.1		1	7.4	20	11/08/2023 1756
PFTeDA	ND	ND		1	0.00	20	11/08/2023 1756
PFTrDA	ND	ND		1	0.00	20	11/08/2023 1756
PFUdA	ND	ND		1	0.00	20	11/08/2023 1756
PFOS	18	20		1	9.8	20	11/08/2023 1756

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	241	25-150
13C2_6:2FTS	N	202	25-150
13C2_8:2FTS		146	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		52	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		80	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: YJ26022-018DU
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		93	25-150
13C7_PFUdA		86	25-150
13C8_PFOA		105	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-019MS
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	15	17		1	114	50-150	11/08/2023 1839
11Cl-PF3OUdS	ND	15	14		1	96	50-150	11/08/2023 1839
8:2 FTS	ND	15	17		1	112	50-150	11/08/2023 1839
6:2 FTS	ND	15	14		1	96	50-150	11/08/2023 1839
4:2 FTS	ND	15	15		1	105	50-150	11/08/2023 1839
GenX	ND	32	38		1	120	50-150	11/08/2023 1839
ADONA	ND	15	16		1	107	50-150	11/08/2023 1839
EtFOSAA	ND	16	17		1	110	50-150	11/08/2023 1839
MeFOSAA	ND	16	17		1	105	50-150	11/08/2023 1839
PFBS	0.92	14	14		1	96	50-150	11/08/2023 1839
PFDS	ND	15	14		1	91	50-150	11/08/2023 1839
PFHpS	ND	15	16		1	107	50-150	11/08/2023 1839
PFNS	ND	15	14		1	92	50-150	11/08/2023 1839
PFOSA	ND	16	16		1	104	50-150	11/08/2023 1839
PFPeS	ND	15	16		1	110	50-150	11/08/2023 1839
PFHxS	ND	14	17		1	117	50-150	11/08/2023 1839
PFBA	1.4	16	17		1	101	50-150	11/08/2023 1839
PFDA	ND	16	17		1	108	50-150	11/08/2023 1839
PFDoA	ND	16	16		1	104	50-150	11/08/2023 1839
PFHpA	ND	16	17		1	107	50-150	11/08/2023 1839
PFHxA	0.82	16	16		1	95	50-150	11/08/2023 1839
PFNA	ND	16	16		1	104	50-150	11/08/2023 1839
PFOA	ND	16	17		1	106	50-150	11/08/2023 1839
PFPeA	0.75	16	17		1	103	50-150	11/08/2023 1839
PFTeDA	ND	16	16		1	99	50-150	11/08/2023 1839
PFTrDA	ND	16	15		1	93	50-150	11/08/2023 1839
PFUdA	ND	16	15		1	93	50-150	11/08/2023 1839
PFOS	7.0	15	23		1	107	50-150	11/08/2023 1839

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	253	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		75	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: YJ26022-019MS
Batch: 89244
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/06/2023 1021

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		102	25-150
13C7_PFUdA		92	25-150
13C8_PFOA		118	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
108 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 151288

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 Marina.Samp@arcadis.com	Quote No.
Address: 28550 Cabot Drive Ste 500	Sampler's Signature: x Marina M Samp	Analysis (Attach list if more space is needed)	Page 1 of 3
City: Novi	State: MI	Zip Code: 48377	Printed Name: Marina Samp		
Project Name: EGLE Lansing PFAS Delineation			
Project No.: 30171052a.0373/0316A	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Composition: Grab / Composite	Matrix: Aqueous / Solid / Wipe / Air	No. of Containers by Preservative Type: Unpres. / H2SO4 / HNO3 / HCl / NaOH / Ascorbic Acid / Zinc Acetate / Other	Analysis: EPA 537.1 LL PFAS	Remarks / Cooler I.D.
~~MW-3~~ MichAve-MH-3_102423	10/24/23	0900	C	X	2	X	MS/MSD
Verlinden-MH-5_102423	10/24/23	0930			2		
Osborn-Sanitary-W_102423		0955					Please provide QC, results, EDD for all samples
Osborn-Sanitary-SE_102423		1000					
Osborn-Sanitary-NW_102423		1010					
Osborn-MH-2-SE_102423		1105					
Osborn-MH-2-W_102423		1115					
Osborn-MH-3_102423		1125					
Osborn-CB-2_102423		1135					
Osborn-MH-4-E_102423	↓	1210	↓	↓	↓	↓	

YJ26022
KES2

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Marina Samp / Arcadis	10/24/23	1715	1. Received by: Nolan Schendel / Arcadis	10/24/23	1715
2. Relinquished by: Nolan Schendel / Arcadis	10/24/23	1815	2. Received by: Fedex	10/24/23	1815
3. Relinquished by:	Date	Time	3. Received by:	Date	Time
4. Relinquished by: fedex	10-25-23	1200	4. Laboratory received by: Kayan Timms	10-25-23	1200

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): (Yes) No Ice Pack
Receipt Temp: 1.4 °C 3.4
Temp Blank: ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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www.pacelabs.com

Number 151289

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E mail: 248-994-2318 Marina.Samp@arcadis.com	Quote No.
Address: 28550 Cabot Drive Ste 500	Sampler's Signature: x Marina L Samp	Analysis (Attach list if more space is needed): PFAS MI List+24	Page 2 of 3
City: Novi / State: MI / Zip Code: 48377	Printed Name: Marina Samp		
Project Name: FAGLE Lansing PFAS Delineation			
Project No.: 30171057a.03bA	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Other	No of Containers by Preservative Type: Unpres.	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS MI List+24	Remarks / Cooler I.D.
Osborn-MH-4_102423	10/24/23	1210	G				12						X	Please provide QC results, EDD for all samples
Osborn-MH-4-NE_102423		1215												
Osborn-MH-1-SW_102423		1230												
Osborn-MH-1-SE_102423		1240												
Osborn-MH-1-W_102423		1245												
Osborn-MH-1-E_102423		1250												
Stanley-MH-1_102423		1310												
P2-MH-2_102423		1505												
P3-MH-284_102423		1520												
P2-MH-W_102423		1555												

YJ26022

KE52

Turn Around Time Required (Prior lab approval required for expedited TAT.): [X] Standard [ ] Rush (Specify)

Sample Disposal: [ ] Return to Client [ ] Disposal by Lab

Possible Hazard Identification: [ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison [ ] Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Marina Samp / Arcadis	10/24/23	1715
2. Relinquished by: Nolan Schendel / Arcadis	10/24/23	1810
3. Relinquished by:	Date	Time
4. Relinquished by: Fedex	10.25.23	1200

	Date	Time
1. Received by: Nolan Schendel / Arcadis	10/24/23	1715
2. Received by: Fedex	10/24/23	1810
3. Received by:	Date	Time
4. Laboratory received by: [signature]	10.25.23	1200

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack — Receipt Temp 3.5 °C 3.4 °C — Temp Blank Y N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2 6)

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www.pacelabs.com

Number 151262

Client: Arcadis	Report to Contact: Marina Samp	Telephone No. / E-mail: 248-994-2318 Marina.Samp@arcadis.com	Quote No.
Address: 28550 Cabot Drive Ste 500	Sampler's Signature: x Marina R Samp	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Novi / State: MI / Zip Code: 48377	Printed Name: Marina Samp		YJ26022
Project Name: PACER Lansing PFAS Delineation			KES2
Project No.: 30171058.0373	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	Matrix	No of Containers by Preservative Type	Analysis	Remarks / Cooler I.D.
DUP-01_102423	10/24/23	—	GW	2	EPA 533 PFAS UCL List 28	Please provide QC results. EDD for all samples
DUP-02_102423	↓	—	↓	↓	↓	
EB-01	↓	—	↓	↓	↓	
FB-01	↓	—	↓	↓	↓	
Trip Blank						

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Marina Samp / Arcadis	10/24/23	1715	1. Received by: Nolan Schendel / Arcadis	10/24/23	1715
2. Relinquished by: Nolan Schendel / Arcadis	10/24/23	1810	2. Received by: Fedex	10/24/23	1810
3. Relinquished by:	Date	Time	3. Received by:	Date	Time
4. Relinquished by: fedex	10-24-23	1200	4. Laboratory received by: [signature]	Date	Time

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 1.4 °C — Temp Blank (Y) ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MEDCONE-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: KDRW / 10/26/2023 Lot #: Y526022

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:			
☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA
3.5 / 3.5 °C 1.4 / 1.4 °C 3.4 / 3.4 °C NA / NA °C
Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C
Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Racer – Lansing Plant 2,3&6

Data Review

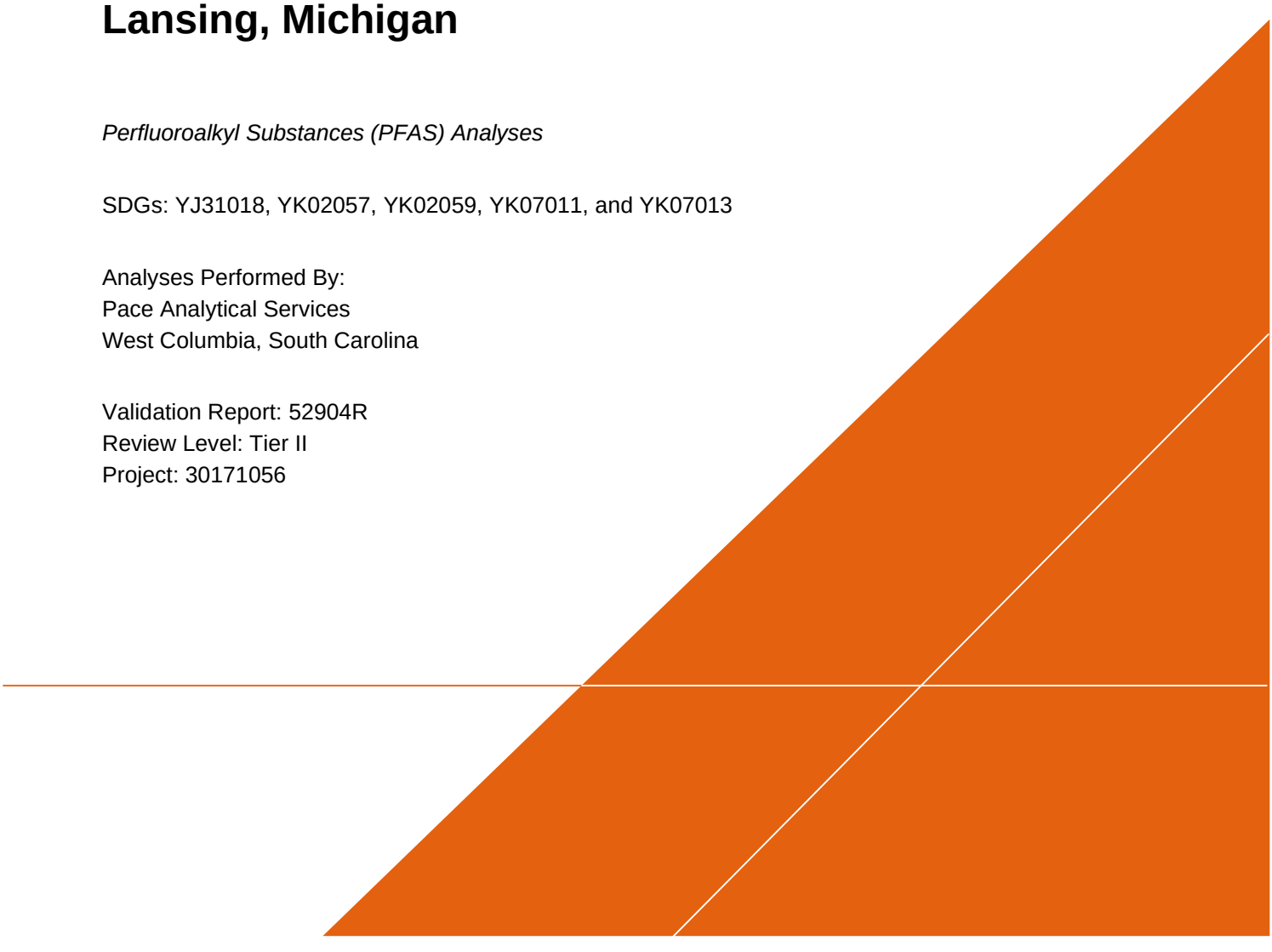
Lansing, Michigan

Perfluoroalkyl Substances (PFAS) Analyses

SDGs: YJ31018, YK02057, YK02059, YK07011, and YK07013

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Validation Report: 52904R
Review Level: Tier II
Project: 30171056



Summary

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) YJ31018, YK02057, YK02059, YK07011, and YK07013 for samples collected in association with the Plants 2, 3 and 6 sites in Lansing Michigan. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain-of-custody (COC) records. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	Metals	Misc.
MW-14-58R_102423	YJ31018-001	Water	10/24/2023		X		
EB-01_102423	YJ31018-002	Water	10/24/2023		X		
P2-MW-02_102523	YJ31018-003	Water	10/25/2023		X		
MW-21-139_102523	YJ31018-004	Water	10/25/2023		X		
P2-MW-04_102523	YJ31018-005	Water	10/25/2023		X		
MW-14-59_102523	YJ31018-006	Water	10/25/2023		X		
EB-02_102523	YJ31018-007	Water	10/25/2023		X		
MW-14-61_102623	YJ31018-008	Water	10/26/2023		X		
MW-14-60_102623	YJ31018-009	Water	10/26/2023		X		
MW-14-62_102623	YJ31018-010	Water	10/26/2023		X		
MW-12-18_102623	YJ31018-011	Water	10/26/2023		X		
DUP-02_102623	YJ31018-012	Water	10/26/2023	MW-12-18_102623	X		
MW-12-09_102623	YJ31018-013	Water	10/26/2023		X		
EB-03_102723	YJ31018-014	Water	10/27/2023		X		
MW-14-56_102723	YJ31018-015	Water	10/27/2023		X		
MW-20-130_102723	YJ31018-016	Water	10/27/2023		X		
MW-16-81_102723	YJ31018-017	Water	10/27/2023		X		
MW-15-72_102723	YJ31018-018	Water	10/27/2023		X		
DUP-04_102723	YJ31018-019	Water	10/27/2023	MW-14-56_102723	X		
MW-22-152_102723	YK02057-001	Water	10/27/2023		X		
DUP-16_102723	YK02057-002	Water	10/27/2023	MW-22-152_102723	X		
MW-21-136_103023	YK02057-003	Water	10/30/2023		X		
MW-21-137_103023	YK02057-004	Water	10/30/2023		X		
MW-21-138_103023	YK02057-005	Water	10/30/2023		X		
MW-22-143_103023	YK02057-006	Water	10/30/2023		X		
MW-22-158_103023	YK02057-007	Water	10/30/2023		X		
MW-22-144_103023	YK02057-008	Water	10/30/2023		X		
MW-22-145_103023	YK02057-009	Water	10/30/2023		X		
DUP-15_103023	YK02057-010	Water	10/30/2023	MW-22-144_103023	X		

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	Metals	Misc.
MW-12-10R_103023	YK02057-011	Water	10/30/2023		X		
DUP-12_103023	YK02057-012	Water	10/30/2023	MW-12-10R_103023	X		
EB-05_103023	YK02057-013	Water	10/30/2023		X		
MW-14-66_103123	YK02057-014	Water	10/31/2023		X		
P6-SB-18_103123	YK02057-015	Water	10/31/2023		X		
MW-14-67_103123	YK02057-016	Water	10/31/2023		X		
MW-13-36R_103123	YK02057-017	Water	10/31/2023		X		
MW-14-70_103123	YK02057-018	Water	10/31/2023		X		
MW-12-13_103123	YK02057-019	Water	10/31/2023		X		
MW-21-133_110123	YK02057-020	Water	11/1/2023		X		
MW-21-134_110123	YK02057-021	Water	11/1/2023		X		
MW-21-135_110123	YK02057-022	Water	11/1/2023		X		
EB-06_103123	YK02059-001	Water	10/31/2023		X		
MW-22-160_103123	YK02059-002	Water	10/31/2023		X		
MW-22-146_103123	YK02059-003	Water	10/31/2023		X		
MW-22-147_103123	YK02059-004	Water	10/31/2023		X		
MW-22-148_103123	YK02059-005	Water	10/31/2023		X		
MW-22-149_103123	YK02059-006	Water	10/31/2023		X		
MW-22-150_103123	YK02059-007	Water	10/31/2023		X		
MW-22-151_103123	YK02059-008	Water	10/31/2023		X		
MW-04-04R_103023	YK02059-009	Water	10/30/2023		X		
MW-04-06R_103123	YK02059-010	Water	10/31/2023		X		
MW-20-131_103123	YK02059-011	Water	10/31/2023		X		
MW-04-05(6)_103123	YK02059-012	Water	10/31/2023		X		
MW-20-132_103123	YK02059-013	Water	10/31/2023		X		
MW-12-11_103123	YK02059-014	Water	10/31/2023		X		
MW-12-12_110123	YK02059-015	Water	11/1/2023		X		
P6-SB-07_110123	YK02059-016	Water	11/1/2023		X		
DUP-14_103123	YK02059-017	Water	10/31/2023	MW-04-06R_103123	X		
EB-04-103023	YK02059-018	Water	10/30/2023		X		
MW-18-93_110223	YK07011-001	Water	11/2/2023		X		
MW-02-04(3)_110223	YK07011-002	Water	11/2/2023		X		
MW-18-94_110323	YK07011-003	Water	11/3/2023		X		
MW-18-101_110323	YK07011-004	Water	11/3/2023		X		
MW-18-97_110323	YK07011-005	Water	11/3/2023		X		
MW-23_110323	YK07011-006	Water	11/3/2023		X		
MW-91-2R_110323	YK07011-007	Water	11/3/2023		X		
MW-18-89_110423	YK07011-008	Water	11/4/2023		X		
DUP-07_110423	YK07011-009	Water	11/4/2023	MW-18-89_110423	X		

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	Metals	Misc.
DUP-09_110323	YK07011-010	Water	11/3/2023	MW-18-101_110323	X		
MW-19-111_110423	YK07011-011	Water	11/4/2023		X		
MW-19-108_110423	YK07011-012	Water	11/4/2023		X		
MW-18-92_110423	YK07011-013	Water	11/4/2023		X		
MW-19-107_110423	YK07011-014	Water	11/4/2023		X		
MW-18-102_110223	YK07013-001	Water	11/2/2023		X		
MW-18-103_110223	YK07013-002	Water	11/2/2023		X		
MW-18-104_110223	YK07013-003	Water	11/2/2023		X		
MW-18-105_110223	YK07013-004	Water	11/2/2023		X		
MW-19-114_110223	YK07013-005	Water	11/2/2023		X		
MW-18-98_110223	YK07013-006	Water	11/2/2023		X		
MW-18-99_110323	YK07013-007	Water	11/3/2023		X		
MW-19-112_110323	YK07013-008	Water	11/3/2023		X		
MW-18-88_110323	YK07013-009	Water	11/3/2023		X		
MW-18-90_110323	YK07013-010	Water	11/3/2023		X		
MW-18-100_110323	YK07013-011	Water	11/3/2023		X		
MW-18-95_110323	YK07013-012	Water	11/3/2023		X		
MW-18-91_110423	YK07013-013	Water	11/4/2023		X		
UNK-15_110423	YK07013-014	Water	11/4/2023		X		
CH-14-RO_110423	YK07013-015	Water	11/4/2023		X		

Notes:

PFAS = Per- and poly-fluoroalkyl substances

Misc. = Miscellaneous analyses

As specified on the COCs, samples P2-MW-02_102523, MW-21-135_110123, and MW-22-147_103123 were used in the matrix spike/matrix spike duplicate (MS/MSD) analysis.

Analytical Data Package Documentation

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of quality assurance (QA) or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Organic Analysis Introduction

Samples were analyzed for per- and poly-fluoroalkyl substances (PFAS) using Modified United States Environmental Protection Agency (USEPA) Method 537 (modified). The data were reviewed in accordance with the following guidance documents:

- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (EPA 540-R-2020-005), dated November 2020 (with reference, as appropriate, to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999).
- DoD Final General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020.
- Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537 (EPA 910-R-18-001, November 2018).
- Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  J The reported value was obtained from a reading less than the reporting limit but greater than or equal to the method detection limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

R The sample results are rejected as unusable. The compound may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

Perfluoroalkyl Substances (PFAS) Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 537 (modified)	Water	28 days from collection to extraction and 30 days from extraction to analysis	Cool to < 6 °C; Extracts must be stored at room temperature until analysis.

Note: the holding time has been changed from the original holding time documented in USEPA 537 of 14 days to a holding time of 28 days to extraction and 30 days from extraction to analysis. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020 and Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations (EA-19-0001), dated December 2019.

The analyses that exceeded the holding time are presented in the following table; all other holding times were met.

SDG	Sample	Analyte	Extraction Holding Time Criteria	Extraction Completed
YK02057	MW-14-67_103123	Perfluorobutanoic acid (PFBA)	28 Days	39 Days
YK07013	MW-18-90_110323	Perfluorooctane sulfonic acid		48 Days
	CH-14-RO_110423	All PFAS compounds		47 Days

Sample results for parameters that were analyzed past the recommended holding times were qualified as specified in the table below.

Criteria	Qualification	
	Detects	Non-detects
Analysis or extraction completed > holding time (but < 2x holding time)	J	UJ

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

If a compound is detected in a blank at a concentration greater than the detection limit (DL), a blank action level (BAL) is calculated at five times the concentration detected in the blank. Detected compounds in the associated samples are compared to the BAL. If the result is greater than the BAL, no qualification is required, and any laboratory-assigned flags are removed, otherwise the result is qualified.

Target compounds were not detected above the MDL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Isotopically Labeled Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. For aqueous samples prepared by serial dilution instead of solid phase extraction, they must be added to samples prior to analysis. EIS recoveries must be within the control limits of 25% to 150%.

Samples associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

SDG	Sample	EIS	Recovery	Associated Compound
YJ31018	MW-14-58R_102423	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
	P2-MW-02_102523	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-21-139_102523	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	P2-MW-04_102523	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
	MW-14-59_102523	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-14-60_102623	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
	MW-14-62_102623	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
		13C4-PFBA	< 10 %	Perfluorobutanoic acid (PFBA)
		13C5-PFPeA	< 10 %	Perfluoropentanoic acid (PFPeA)
YJ31018	MW-12-18_102623	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-12-09_102623	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-20-130_102723	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-16-81_102723	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-15-72_102723	13C2-4:2FTS	> 150 %	4:2 FTS
YK02057	MW-12-10R_103023	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	DUP-12_103023	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-14-66_103123	13C2-4:2FTS	> 150 %	4:2 FTS
	P6-SB-18_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-13-36R_103123	13C2-4:2FTS	> 150 %	4:2 FTS

SDG	Sample	EIS	Recovery	Associated Compound
YK02057	MW-13-36R_103123	13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
		13C4-PFBA	< 10 %	Perfluorobutanoic acid (PFBA)
		13C5-PFPeA	< 10 %	Perfluoropentanoic acid (PFPeA)
	MW-14-70_103123	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-12-13_103123	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-21-133_110123	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-21-135_110123	13C2-4:2FTS	> 150 %	4:2 FTS
YK02059	MW-22-147_103123	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-22-150_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-22-151_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-PFTeDA	< 10 %	Perfluorotetradecanoic acid (PFTeA)
	MW-04-06R_103123	13C2-PFDoA	< 25 % but > 10 %	Perfluorododecanoic acid (PFDoA)
				Perfluorotridecanoic Acid (PFTriA)
		13C2-PFTeDA	< 10 %	Perfluorotetradecanoic acid (PFTeA)
	MW-20-131_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-04-05(6)_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-20-132_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-12-11_103123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-PFTeDA	< 25 % but > 10 %	Perfluorotetradecanoic acid (PFTeA)
	MW-12-12_110123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
YK02059	MW-12-12_110123	13C2-8:2FTS	> 150 %	8:2FTS
	P6-SB-07_110123	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	EB-04-103023	13C2-6:2FTS	> 150 %	6:2FTS
YK07011	MW-18-89_110423	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	DUP-07_110423	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-19-107_110423	13C2-4:2FTS	> 150 %	4:2 FTS
YK07013	MW-18-99_110323	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-18-88_110323	13C2-4:2FTS	> 150 %	4:2 FTS
	MW-18-90_110323	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS

SDG	Sample	EIS	Recovery	Associated Compound
YK07013	MW-18-90_110323	13C4-PFBA	< 10 %	Perfluorobutanoic acid (PFBA)
		13C5-PFPeA	< 25 % but > 10 %	Perfluoropentanoic acid (PFPeA)
	MW-18-95_110323	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
	MW-18-91_110423	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS
		13C2-8:2FTS	> 150 %	8:2FTS
	UNK-15_110423	13C2-4:2FTS	> 150 %	4:2 FTS
		13C2-6:2FTS	> 150 %	6:2FTS

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J
< 25% but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	R

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. When an MSD analysis is performed, the relative percent difference (RPD) between the MS/MSD results must be no greater than 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

Samples P2-MW-02_102523, MW-21-135_110123, MW-22-147_103123, and MW-19-107_110423 were used in the MS/MSD analyses, and samples MW-21-138_103023, MW-12-11_103123, MW-18-101_110323, and MW-18-104_110223 were used in the MS analyses. The MS/MSD analysis exhibited acceptable results except as follows.

SDG	Sample	Compound	MS Recovery	MSD Recovery
YK02057	MW-21-135_110123	6:2FTS	> UL	> UL
		Perfluorooctanoic acid	< LL but > 10%	Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of MS/MSD deviations, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > 4x the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample results associated with MS/MSD analyses exhibiting RPDs greater than the control limits are presented in the following table.

SDG	Sample	Compound
YK02057	MW-21-135_110123	4:2 FTS
YK02059	MW-22-147_103123	6:2FTS N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)

The criteria used to evaluate the RPD between the MS and MSD are presented in the following table; in the case of RPD deviations, the sample results are qualified as documented.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

5. Laboratory Duplicate Sample Analysis

Laboratory duplicate sample results are used to assess precision and may be used in addition to or in lieu of the MSD analysis. The laboratory duplicate sample RPD criteria are applied when parent and duplicate sample concentrations are at least five times the RL and are established by the analytical laboratory. In the case where the parent and duplicate sample concentrations are less than five times the RL, a control limit of one times the RL for water matrices and two times the RL for soil matrices is applied to the difference between the results.

Samples MW-22-145_103023, P6-SB-07_110123, MW-18-97_110323, and MW-18-98_110223 were used in the laboratory duplicate sample analyses. The laboratory duplicate sample analyses exhibited acceptable results.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

The LCS analyses exhibited acceptable results.

7. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. The control limits of 30% for water matrices and 50% for soil and sediment matrices are applied to the RPDs between the primary and field duplicate sample results. In the instance when the parent and duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL for water matrices or three times to RL for soil and sediment matrices is applied to the difference between the results.

Results for the field duplicate sample results are summarized in the following tables.

Sample and Field Duplicate Sample: MW-12-18_102623 and DUP-02_102623						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanesulfonic acid (PFBS)	0.77 J	1.1 J	N/A	0.33	3.7	Acceptable
Perfluorobutanoic acid (PFBA)	8.4	8.3	N/A	0.1	3.7	Acceptable
Perfluoroheptanoic acid (PFHpA)	3.4 J	3.2 J	N/A	0.2	3.7	Acceptable
Perfluorohexanesulfonic acid (PFHxS)	0.86 J	1.0 J	N/A	0.14	3.7	Acceptable
Perfluorohexanoic acid (PFHxA)	5.3	5.3	N/A	0.0	3.7	Acceptable
Perfluorooctanoic acid	2.2 J	2.3 J	N/A	0.1	3.7	Acceptable
Perfluoropentanoic acid (PFPeA)	5.3	5.3	N/A	0.0	3.7	Acceptable

Sample and Field Duplicate Sample: MW-14-56_102723 and DUP-04_102723						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanoic acid (PFBA)	7.3	7.9	N/A	0.6	3.5	Acceptable
Perfluorohexanoic acid (PFHxA)	1.8 J	2.2 J	N/A	0.4	3.5	Acceptable
Perfluorooctane sulfonic acid	1.7 J	3.5 U	N/A	1.8	3.5	Acceptable
Perfluorooctanoic acid	0.91 J	3.5 U	N/A	2.59	3.5	Acceptable
Perfluoropentanoic acid (PFPeA)	8.3	9.3	N/A	1.0	3.5	Acceptable

Sample and Field Duplicate Sample: MW-22-152_102723 and DUP-16_102723						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanesulfonic acid (PFBS)	18	17	5.7 %	N/A	3.5	Acceptable
Perfluorobutanoic acid (PFBA)	6.2	6	N/A	0.2	3.5	Acceptable
Perfluoroheptanoic acid (PFHpA)	1.8 J	2.0 J	N/A	0.2	3.5	Acceptable
Perfluorohexanesulfonic acid (PFHxS)	4.9	5.3	N/A	0.4	3.5	Acceptable
Perfluorohexanoic acid (PFHxA)	3.2 J	3.3 J	N/A	0.1	3.5	Acceptable
Perfluorooctane sulfonic acid	2.9 J	3.1 J	N/A	0.2	3.5	Acceptable
Perfluorooctanoic acid	5.7	5.7	N/A	0.0	3.5	Acceptable
Perfluoropentanesulfonic acid (PFPeS)	0.64 J	0.82 J	N/A	0.18	3.5	Acceptable
Perfluoropentanoic acid (PFPeA)	4.2	4.4	N/A	0.2	3.5	Acceptable

Sample and Field Duplicate Sample: MW-22-144_103023 and DUP-15_103023						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanesulfonic acid (PFBS)	2.3 J	2.5 J	N/A	0.2	3.5	Acceptable
Perfluorobutanoic acid (PFBA)	4.3	4.3	N/A	0	3.5	Acceptable
Perfluoroheptanoic acid (PFHpA)	3.5	3.5	N/A	0	3.5	Acceptable
Perfluorohexanesulfonic acid (PFHxS)	6.7	6.5	N/A	0.2	3.5	Acceptable
Perfluorohexanoic acid (PFHxA)	6.6	6.6	N/A	0	3.5	Acceptable
Perfluorooctanoic acid	6.4	6.4	N/A	0	3.5	Acceptable
Perfluoropentanoic acid (PFPeA)	5.7	5.2	N/A	0.5	3.5	Acceptable

Sample and Field Duplicate Sample: MW-12-10R_103023 and DUP-12_103023						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanoic acid (PFBA)	9.9	9.6	N/A	0.3	3.5	Acceptable
Perfluoroheptanoic acid (PFHpA)	4.6	5.1	N/A	0.5	3.5	Acceptable
Perfluorohexanesulfonic acid (PFHxS)	3.3 J	3.5 U	N/A	0.2	3.5	Acceptable
Perfluorononanoic acid (PFNA)	0.71 J	0.88 J	N/A	0.17	3.5	Acceptable
Perfluorooctane sulfonic acid	11	10	N/A	1	3.5	Acceptable
Perfluorooctanoic acid	8.6	8.3	N/A	0.3	3.5	Acceptable
Perfluoropentanoic acid (PFPeA)	6.1	3.5 U	N/A	2.6	3.5	Acceptable

Sample and Field Duplicate Sample: MW-04-06R_103123 and DUP-14_103123						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanoic acid (PFBA)	4.1	40 U	N/A	35.9	40	Acceptable
Perfluoropentanoic acid (PFPeA)	1.4 J	40 U	N/A	38.6	40	Acceptable

Sample and Field Duplicate Sample: MW-18-101_110323 and DUP-09_110323						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanoic acid (PFBA)	4.2	3.6	N/A	0.6	3.5	Acceptable

Sample and Field Duplicate Sample: MW-18-89_110423 and DUP-07_110423						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorobutanesulfonic acid (PFBS)	3.3 U	1.3 J	N/A	2.0	3.5	Acceptable
Perfluorobutanoic acid (PFBA)	8.9	7.9	N/A	1.0	3.5	Acceptable
Perfluoroheptanesulfonic Acid (PFHpS)	3.3 U	2.3 J	N/A	1.0	3.5	Acceptable
Perfluoroheptanoic acid (PFHpA)	4.4	4.2	N/A	0.2	3.5	Acceptable

Sample and Field Duplicate Sample: MW-18-89_110423 and DUP-07_110423						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Perfluorohexanesulfonic acid (PFHxS)	5.8	4.9	N/A	0.9	3.5	Acceptable
Perfluorohexanoic acid (PFHxA)	7.5	6.3	N/A	1.2	3.5	Acceptable
Perfluorononanoic acid (PFNA)	1.3 J	3.5 U	N/A	2.2	3.5	Acceptable
Perfluorooctane sulfonic acid	170	150	12.5 %	N/A	3.5	Acceptable
Perfluorooctanoic acid	14	12	N/A	2.0	3.5	Acceptable
Perfluoropentanesulfonic acid (PFPeS)	3.3 U	0.95 J	N/A	2.35	3.5	Acceptable
Perfluoropentanoic acid (PFPeA)	6.7	5.4	N/A	1.3	3.5	Acceptable

Notes: N/A = Not applicable
U = Not detected
J = Estimated (result is < reporting limit)

The field duplicate samples exhibited acceptable results.

8. Compound Identification

PFAS compounds are identified using the compound's ion abundance ratios, signal-to-noise values, and relative retention times. All detected sample results met the identification criteria.

The laboratory extrapolated the calibration curve to quantify the following sample result because the concentration was over-range, and no dilution analysis was performed. Therefore, this result was qualified as estimated.

SDG	Sample	Compound	Result
YJ31018	MW-21-139_102523	Perfluorooctane sulfonic acid	2100 EJ

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for PFAS

PFAS: USEPA 537 (modified)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Liquid Chromatography/Mass Spectrometry (LC/MS/MS)					
Tier II Validation					
Holding Times		X	X		
Reporting Limits (Units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment and/or Field Blanks		X		X	
Matrix Spike (MS) Accuracy (%R)		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD RPD	X				X
Laboratory Duplicate Sample RPD		X		X	
Field Duplicate Sample RPD		X		X	
Extracted Internal Standards %R		X	X		
Dilution Factor		X		X	
Compound quantitation		X	X		

Notes:
%R = Percent recovery
RPD = Relative percent difference
%RSD = Relative standard deviation
%D = Percent difference

Validation Performed By: Dennis Dyke

Signature: 

Date: February 11, 2024

Chain Of Custody and Validated Sample Analysis Data Sheets

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West Columbia, South Carolina 29172
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Pace Analytical Plant 2

Chain of Custody Record

Number

| | | |

Pace Analytical® Plant 2

Chain of Custody Record

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Number

| | | |

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-001**

Description: **MW-14-58R_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1300** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1611	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.5	0.39	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.5	0.54	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.5	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.5	1.6	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.5	0.72	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.5	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.5	0.61	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.5	0.76	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.34	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.64	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.41	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.58	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.3**	**0.49**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.43	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**7.3**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.4**		**3.3**	**0.56**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.3	0.38	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.3**	**0.68**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**7.3**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.43	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.2**		**3.3**	**1.6**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	203	25-150
13C2_6:2FTS	N	231	25-150
13C2_8:2FTS	N	183	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		32	25-150
13C4_PFHpA		65	25-150
13C5_PFHxA		69	25-150
13C5_PFPeA		53	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-001**

Description: **MW-14-58R_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1300** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-002**

Description: **EB-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1622	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		94	25-150
13C4_PFHpA		92	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-002**

Description: **EB-01_102423** Matrix: **Aqueous**

Date Sampled: **10/24/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-003**

Description: **P2-MW-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1030** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1632	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.1	0.67	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.1	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.1	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	8.1	0.88	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.1	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.1	0.49	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.1	0.76	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.1	0.94	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.0	0.42	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.0	0.79	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.0	0.50	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.0	0.72	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.0	0.62	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.0	0.60	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.0	0.56	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.4**	**J**	**4.0**	**0.61**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.82**	**J**	**4.0**	**0.48**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.1**	**J**	**4.0**	**0.45**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.2**		**4.0**	**0.69**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.0	0.47	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.8**	**J**	**4.0**	**0.84**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.9**		**4.0**	**0.55**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.0	0.61	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.0	0.53	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.0	0.63	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**4.0**	**2.0**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	200	25-150
13C2_6:2FTS	N	203	25-150
13C2_8:2FTS		132	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		69	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		90	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-003**

Description: **P2-MW-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1030** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**55**		**6.9**	**1.4**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**53**	**Q J**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**21**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**29**		**3.5**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	**68259-12-1**	**PFAS by ID SOP**	**0.66**	**J**	**3.5**	**0.62**	**ng/L**	**1**
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**30**		**3.5**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**300**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**48**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.6**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**73**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**92**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**22**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**91**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2100**	**E J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
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N = Recovery is out of criteria
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		69	4.2	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		69	5.7	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**48**	**J**	**69**	**14**	**ng/L**	**2**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**52**	**J**	**69**	**17**	**ng/L**	**2**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	69	7.6	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		69	18	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		69	4.2	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		69	6.5	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		69	8.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**20**	**J**	**35**	**3.6**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		35	6.7	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**32**	**J**	**35**	**4.3**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		35	6.2	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		35	5.3	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**29**	**J**	**35**	**5.1**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**290**		**35**	**4.8**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**52**		**35**	**5.2**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**6.9**	**J**	**35**	**4.5**	**ng/L**	**2**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		35	4.1	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**78**		**35**	**3.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**98**		**35**	**6.0**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**22**	**J**	**35**	**4.0**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**		**35**	**7.2**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**93**		**35**	**4.7**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		35	5.2	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		35	4.6	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		35	5.4	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2300**		**35**	**17**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-004**

Description: **MW-21-139_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1205** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1704	BWS	11/07/2023 1059	89356
2	SOP SPE	PFAS by ID SOP	10	11/20/2023 1716	BWS	11/07/2023 1059	89356
3	SOP SPE	PFAS by ID SOP	1	12/01/2023 2337	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	3
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	3
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**57**		**6.9**	**1.4**	**ng/L**	**3**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**65**	**Q**	**6.9**	**1.7**	**ng/L**	**3**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	3
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	3
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**22**		**3.4**	**0.36**	**ng/L**	**3**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	3
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**39**		**3.4**	**0.43**	**ng/L**	**3**
Perfluoro-1-nonanesulfonic acid (PFNS)	**68259-12-1**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.61**	**ng/L**	**3**
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.53**	**ng/L**	**3**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**28**		**3.4**	**0.51**	**ng/L**	**3**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**340**	**E**	**3.4**	**0.47**	**ng/L**	**3**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**53**		**3.4**	**0.52**	**ng/L**	**3**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.45**	**ng/L**	**3**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**79**		**3.4**	**0.38**	**ng/L**	**3**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**100**		**3.4**	**0.59**	**ng/L**	**3**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**23**		**3.4**	**0.40**	**ng/L**	**3**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**120**		**3.4**	**0.71**	**ng/L**	**3**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**96**		**3.4**	**0.47**	**ng/L**	**3**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2300**	**E**	**3.4**	**1.7**	**ng/L**	**3**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	241	25-150	N	151	25-150	N	200	25-150
13C2_6:2FTS	N	194	25-150		116	25-150	N	219	25-150
13C2_8:2FTS		107	25-150		105	25-150		122	25-150
13C2_PFDoA		76	25-150		92	25-150		67	25-150
13C2_PFTeDA		78	25-150		88	25-150		66	25-150
13C3_PFBS		75	25-150		106	25-150		92	25-150
13C3_PFHxS		83	25-150		101	25-150		94	25-150
13C3-HFPO-DA		73	25-150		98	25-150		78	25-150
13C4_PFBA		46	25-150		102	25-150		45	25-150
13C4_PFHpA		70	25-150		97	25-150		74	25-150
13C5_PFHxA		86	25-150		105	25-150		86	25-150
13C5_PFPeA		68	25-150		105	25-150		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-004**
Description: **MW-21-139_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1205**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		80	25-150		105	25-150		86	25-150
13C7_PFUdA		72	25-150		96	25-150		71	25-150
13C8_PFOA		92	25-150		103	25-150		85	25-150
13C8_PFOS		67	25-150		81	25-150		79	25-150
13C8_PFOSA		73	10-150		115	10-150		90	10-150
13C9_PFNA		67	25-150		100	25-150		74	25-150
d5-EtFOSAA		90	25-150		84	25-150		79	25-150
d3-MeFOSAA		79	25-150		93	25-150		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-005**

Description: **P2-MW-04_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/17/2023 1715	BWS	11/07/2023 1059	89356

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**9.7**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.6**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**31**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	218	25-150
13C2_6:2FTS	N	228	25-150
13C2_8:2FTS	N	208	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		62	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		49	25-150
13C4_PFBA		30	25-150
13C4_PFHpA		59	25-150
13C5_PFHxA		55	25-150
13C5_PFPeA		43	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-005**

Description: **P2-MW-04_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	25-150
13C8_PFOS		71	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		73	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-006**

Description: **MW-14-59_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1410	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.8**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**18**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**15**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	221	25-150
13C2_6:2FTS	N	258	25-150
13C2_8:2FTS		123	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		35	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		70	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-006**
Description: **MW-14-59_102523**
Matrix: **Aqueous**
Date Sampled: **10/25/2023 1425**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		98	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-007**

Description: **EB-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1500** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1421	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS		89	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-007**

Description: **EB-02_102523** Matrix: **Aqueous**

Date Sampled: **10/25/2023 1500** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-008**

Description: **MW-14-61_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1010** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1432	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.68**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-008**

Description: **MW-14-61_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1010** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-009**

Description: **MW-14-60_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1442	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.9**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**27**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.1**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**41**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**44**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	275	25-150
13C2_6:2FTS	N	291	25-150
13C2_8:2FTS	N	210	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		60	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		70	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		63	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-009**
Description: **MW-14-60_102623**
Matrix: **Aqueous**
Date Sampled: **10/26/2023 0955**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		43	25-150
d5-EtFOSAA		119	25-150
d3-MeFOSAA		107	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1453	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1758	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**4.2**	**JQ** J	**6.8**	**1.4**	**ng/L**	**1**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**17**	**Q** J	**6.8**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.6**	**J**	**6.8**	**0.64**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**0.94**	**J**	**6.8**	**0.80**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**4.0**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	R ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.4**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**25**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.7**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**59**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**20**	**Q** J	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**54**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	253	25-150	N	232	25-150
13C2_6:2FTS	N	330	25-150	N	290	25-150
13C2_8:2FTS	N	256	25-150	N	266	25-150
13C2_PFDoA		86	25-150		83	25-150
13C2_PFTeDA		74	25-150		56	25-150
13C3_PFBS		77	25-150		78	25-150
13C3_PFHxS		85	25-150		89	25-150
13C3-HFPO-DA		54	25-150		52	25-150
13C4_PFBA	N	2.0	25-150	N	1.0	25-150
13C4_PFHpA		70	25-150		85	25-150
13C5_PFHxA		63	25-150		65	25-150
13C5_PFPeA	N	10	25-150	N	6.0	25-150
13C6_PFDA		89	25-150		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	25-150		93	25-150
13C8_PFOA		80	25-150		104	25-150
13C8_PFOS		75	25-150		92	25-150
13C8_PFOSA		84	10-150		88	10-150
13C9_PFNA		86	25-150		102	25-150
d5-EtFOSAA		120	25-150		109	25-150
d3-MeFOSAA		102	25-150		108	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1453	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1758	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	**39108-34-4**	**PFAS by ID SOP**	**4.8**	**JQ**	**6.8**	**1.4**	**ng/L**	**2**
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**17**	**Q**	**6.8**	**1.7**	**ng/L**	**2**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.9**	**J**	**6.8**	**0.64**	**ng/L**	**2**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.35**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.52**	**ng/L**	**2**
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.51**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**7.2**		**3.4**	**0.47**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.4**	**J**	**3.4**	**0.45**	**ng/L**	**2**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**20**		**3.4**	**0.38**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.59**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.1**		**3.4**	**0.40**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**53**		**3.4**	**0.71**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**34**	**Q**	**3.4**	**0.47**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**46**		**3.4**	**1.7**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	253	25-150	N	232	25-150
13C2_6:2FTS	N	330	25-150	N	290	25-150
13C2_8:2FTS	N	256	25-150	N	266	25-150
13C2_PFDoA		86	25-150		83	25-150
13C2_PFTeDA		74	25-150		56	25-150
13C3_PFBS		77	25-150		78	25-150
13C3_PFHxS		85	25-150		89	25-150
13C3-HFPO-DA		54	25-150		52	25-150
13C4_PFBA	N	2.0	25-150	N	1.0	25-150
13C4_PFHpA		70	25-150		85	25-150
13C5_PFHxA		63	25-150		65	25-150
13C5_PFPeA	N	10	25-150	N	6.0	25-150
13C6_PFDA		89	25-150		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-010**

Description: **MW-14-62_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1050** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		92	25-150		93	25-150
13C8_PFOA		80	25-150		104	25-150
13C8_PFOS		75	25-150		92	25-150
13C8_PFOSA		84	10-150		88	10-150
13C9_PFNA		86	25-150		102	25-150
d5-EtFOSAA		120	25-150		109	25-150
d3-MeFOSAA		102	25-150		108	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-011**

Description: **MW-12-18_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1504	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	~~Q~~	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.77**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.86**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.4**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.4**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	172	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-011**

Description: **MW-12-18_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-012**

Description: **DUP-02_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1535	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.5	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.5	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.5	0.82	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.5	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.5	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.5	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.5	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**J**	**3.7**	**0.39**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.73	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.47	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.0**	**J**	**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.3**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.2**	**J**	**3.7**	**0.42**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.3**	**J**	**3.7**	**0.77**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.51**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		71	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-012**

Description: **DUP-02_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-013**

Description: **MW-12-09_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1345** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1546	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	~~Q~~	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.8**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**11**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**14**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.75**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	179	25-150
13C2_6:2FTS		134	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		67	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-013**

Description: **MW-12-09_102623** Matrix: **Aqueous**

Date Sampled: **10/26/2023 1345** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
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B = Detected in the method blank
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E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-014**

Description: **EB-03_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1557	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.62	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.87	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.39	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		80	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		86	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-014**

Description: **EB-03_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-015**

Description: **MW-14-56_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1607	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.3**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.91**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		139	25-150
13C2_6:2FTS		117	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-015**
Description: **MW-14-56_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1045**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-016**

Description: **MW-20-130_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1225** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1618	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**39**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**13**		**3.5**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**8.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**30**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**70**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**45**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	236	25-150
13C2_6:2FTS	N	167	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		25	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		48	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		65	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-016**
Description: **MW-20-130_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1225**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-017**

Description: **MW-16-81_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1628	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.79**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	168	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		79	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-017**
Description: **MW-16-81_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1340**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-018**

Description: **MW-15-72_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1505** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1639	BWS	11/13/2023 1357	89826

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	167	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		65	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		50	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		75	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YJ31018-018**
Description: **MW-15-72_102723**
Matrix: **Aqueous**
Date Sampled: **10/27/2023 1505**
Project Name: **RACER Lansing GWS**
Date Received: **10/31/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	25-150
13C8_PFOS		69	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		67	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-019**

Description: **DUP-04_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/14/2023 1650	BWS	11/13/2023 1357	89826
2	SOP SPE	PFAS by ID SOP	1	11/20/2023 1809	BWS	11/17/2023 1041	90261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.9**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.3**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		132	25-150		149	25-150
13C2_6:2FTS		113	25-150		128	25-150
13C2_8:2FTS		73	25-150		87	25-150
13C2_PFDoA		47	25-150		57	25-150
13C2_PFTeDA	N	18	25-150		47	25-150
13C3_PFBS		88	25-150		93	25-150
13C3_PFHxS		85	25-150		84	25-150
13C3-HFPO-DA		84	25-150		87	25-150
13C4_PFBA		60	25-150		70	25-150
13C4_PFHpA		89	25-150		99	25-150
13C5_PFHxA		89	25-150		106	25-150
13C5_PFPeA		85	25-150		100	25-150
13C6_PFDA		74	25-150		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YJ31018-019**

Description: **DUP-04_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **10/31/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		64	25-150		72	25-150
13C8_PFOA		80	25-150		108	25-150
13C8_PFOS		77	25-150		89	25-150
13C8_PFOSA		69	10-150		86	10-150
13C9_PFNA		79	25-150		92	25-150
d5-EtFOSAA		70	25-150		74	25-150
d3-MeFOSAA		70	25-150		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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S = MS/MSD failure

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Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt	Telephone No. / E-mail: (248)609-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, Suite 500	Samplers Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 2 of 3
City: Novi; State: MI; Zip Code: 48377	Printed Name: Austin Westhuis		
Project Name: RACER Lansing GWS			Lot # Bar Code (lab use only): YK02057 KES2
Project Number: 60171058.0370A	P.O. No: US3460911578		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	Grab=G Composite=C	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	SE35 Kit	Field filtered	PFAS (Method 537M, EGLE 28 compounds)
MW-12-10R_103023	10/30/23	1730	G	X			2							2
DUP-12_103023	10/30/23	—	G	X			2							2
EB-05_103023	10/30/23	1750	G	X			2							2
MW-14-66_103123	10/31/23	1000	G	X			2							2
P6-SB-18_103123	10/31/23	1100	G	X			2							2
MW-14-67_103123	10/31/23	1200	G	X			2							2
MW-13-36R_103123	10/31/23	1240	G	X			2							2
MW-14-70_103123	10/31/23	1320	G	X			2							2
MW-12-13_103123	10/31/23	1400	G	X			2							2
MW-21-133_10123	11/1/23	1210	G	X			2							2

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements:

1. Relinquished by: [signature] Austin Westhuis/Arcadis	Date: 11/1/23	Time: 1530	1. Received by: FedEx	Date: 11/1/23	Time: 1530
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: Fedex	Date: 11/02/23	Time: 0952	4. Laboratory Received by: [signature]	Date: 11/02/23	Time: 0952

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check): ☒ Y ☐ N ☐ Ice Pack; Receipt Temp: 1.0 °C; Temp. Blank: ☒ Y / ☐ N

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Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt	Telephone No. / E-mail: (248)809-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 29500 Cabot Drive, Suite 500	Sampler's Signature: x	Analysis (Attach list if more space is needed)	Page 3 of 3
City: Novi / State: MI / Zip Code: 48377	Printed Name: Austin Westhuis		Lot # Bar Code (Lab use only)
Project Name: RACER Lansing GWS			
Project Number: 30171056.0370A	P.O. No.: US3460011578		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	(G=Grab) C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS (Method 537M, EGLE 28 compounds)								
MW-21-134_110123	11/1/23	1255	G	X			2							2								
MW-21-135_110123	11/1/23	1415	G	X			6							6								MS/MSD

YK02057

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements

	Relinquished by	Date	Time	Received by	Date	Time
1	Austin Westhuis/Arcadis	11/1/23	1530	FedEx	11/1/23	1530
2						
3						
4	FedEx	11/02/23	0952		11/02/23	0952

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check) ☑ Y ☐ N ☐ Ice Pack — Receipt Temp. 1.0 °C — Temp. Blank ☑ Y / ☐ N

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-001**

Description: **MW-22-152_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1035** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1405	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**18**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.64**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.2**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		79	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		60	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-001**

Description: **MW-22-152_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023 1035** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-002**

Description: **DUP-16_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1416	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**17**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.82**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.0**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.4**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		76	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-002**

Description: **DUP-16_102723** Matrix: **Aqueous**

Date Sampled: **10/27/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-003**

Description: **MW-21-136_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1426	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.96**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.78**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		130	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		86	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-003**

Description: **MW-21-136_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-004**

Description: **MW-21-137_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1055** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1458	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		145	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		53	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-004**

Description: **MW-21-137_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1055** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-005**

Description: **MW-21-138_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1135** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1509	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		128	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		51	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK02057-005**
Description: **MW-21-138_103023**
Matrix: **Aqueous**
Date Sampled: **10/30/2023 1135**
Project Name: **RACER Lansing GWS**
Date Received: **11/02/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-006**

Description: **MW-22-143_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1530	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.6**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.4**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		144	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		61	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-006**

Description: **MW-22-143_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1340** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-007**

Description: **MW-22-158_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1541	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.8**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.0**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		136	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-007**

Description: **MW-22-158_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-008**

Description: **MW-22-144_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1525** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1551	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.7**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.3**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.7**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		109	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		75	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-008**

Description: **MW-22-144_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1525** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-009**

Description: **MW-22-145_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1610** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1602	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.5**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		123	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		71	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-009**

Description: **MW-22-145_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1610** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-010**

Description: **DUP-15_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1623	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.6**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.2**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		125	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		70	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
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N = Recovery is out of criteria
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H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-010**

Description: **DUP-15_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-011**

Description: **MW-12-10R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1730** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1634	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.9**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.6**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.71**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.6**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.1**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**11**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	178	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		62	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		61	25-150
13C5_PFPeA		46	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-011**

Description: **MW-12-10R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1730** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-012**

Description: **DUP-12_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1644	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.1**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.88**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.3**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**10**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	174	25-150
13C2_6:2FTS	N	176	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		70	25-150
13C5_PFHxA		65	25-150
13C5_PFPeA		44	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-012**

Description: **DUP-12_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-013**

Description: **EB-05_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1750** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1655	ELC2	11/19/2023 1118	90388

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150
13C2_6:2FTS		90	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-013**

Description: **EB-05_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1750** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-014**

Description: **MW-14-66_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1748	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**34**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**7.2**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**32**		**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**8.5**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**50**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**24**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**200**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	164	25-150
13C2_6:2FTS		147	25-150
13C2_8:2FTS		137	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		68	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		64	25-150
13C4_PFBA		41	25-150
13C4_PFHpA		67	25-150
13C5_PFHxA		62	25-150
13C5_PFPeA		56	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-014**

Description: **MW-14-66_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1000** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		66	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		76	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-015**

Description: **P6-SB-18_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1759	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**1.1**	**J**	**7.1**	**0.66**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**0.83**	**J**	**7.1**	**0.83**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	**335-77-3**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.69**	**ng/L**	**1**
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**26**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**12**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**23**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**22**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**24**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.57**	**J**	**3.5**	**0.55**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**29**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	212	25-150
13C2_6:2FTS	N	197	25-150
13C2_8:2FTS		142	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		63	25-150
13C4_PFBA		38	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		62	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-015**

Description: **P6-SB-18_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1809	ELC2	11/20/2023 1010	90414
2	SOP SPE	PFAS by ID SOP	1	12/15/2023 2030	OMNS	12/09/2023 1923	91883

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	~~46~~ **Q** 43 J		**3.4**	**0.52**	**ng/L**	~~1~~ 2
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**1.2 J**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**37**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**79**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.54 J**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**20**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**60**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.7 J**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		141	25-150	HN	174	25-150
13C2_6:2FTS		148	25-150	H	113	25-150
13C2_8:2FTS		89	25-150	H	88	25-150
13C2_PFDoA		77	25-150	H	73	25-150
13C2_PFTeDA		76	25-150	H	71	25-150
13C3_PFBS		69	25-150	H	62	25-150
13C3_PFHxS		85	25-150	H	74	25-150
13C3-HFPO-DA		57	25-150	H	73	25-150
13C4_PFBA	N	23	25-150	H	39	25-150
13C4_PFHpA		69	25-150	H	88	25-150
13C5_PFHxA		59	25-150	H	74	25-150
13C5_PFPeA		40	25-150	H	62	25-150
13C6_PFDA		79	25-150	H	82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		79	25-150	H	76	25-150
13C8_PFOA		84	25-150	H	92	25-150
13C8_PFOS		82	25-150	H	77	25-150
13C8_PFOSA		81	10-150	H	80	10-150
13C9_PFNA		87	25-150	H	86	25-150
d5-EtFOSAA		85	25-150	H	69	25-150
d3-MeFOSAA		87	25-150	H	75	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1809	ELC2	11/20/2023 1010	90414
2	SOP SPE	PFAS by ID SOP	1	12/15/2023 2030	OMNS	12/09/2023 1923	91883

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	7.0	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	7.0	0.58	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	7.0	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	7.0	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	HQ	7.0	0.76	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	7.0	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	7.0	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	7.0	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	7.0	0.81	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.6**	**HJ**	**3.5**	**0.36**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.5	0.68	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.5	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.5	0.62	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	3.5	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**43**	**H**	**3.5**	**0.52**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**33**	**H**	**3.5**	**0.39**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**77**	**H**	**3.5**	**0.60**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.61**	**HJ**	**3.5**	**0.40**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**18**	**H**	**3.5**	**0.72**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**60**	**H**	**3.5**	**0.47**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.5	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.5	1.7	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		141	25-150	HN	174	25-150
13C2_6:2FTS		148	25-150	H	113	25-150
13C2_8:2FTS		89	25-150	H	88	25-150
13C2_PFDoA		77	25-150	H	73	25-150
13C2_PFTeDA		76	25-150	H	71	25-150
13C3_PFBS		69	25-150	H	62	25-150
13C3_PFHxS		85	25-150	H	74	25-150
13C3-HFPO-DA		57	25-150	H	73	25-150
13C4_PFBA	N	23	25-150	H	39	25-150
13C4_PFHpA		69	25-150	H	88	25-150
13C5_PFHxA		59	25-150	H	74	25-150
13C5_PFPeA		40	25-150	H	62	25-150
13C6_PFDA		79	25-150	H	82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-016**

Description: **MW-14-67_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		79	25-150	H	76	25-150
13C8_PFOA		84	25-150	H	92	25-150
13C8_PFOS		82	25-150	H	77	25-150
13C8_PFOSA		81	10-150	H	80	10-150
13C9_PFNA		87	25-150	H	86	25-150
d5-EtFOSAA		85	25-150	H	69	25-150
d3-MeFOSAA		87	25-150	H	75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-017**

Description: **MW-13-36R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1240** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1820	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	**2991-50-6**	**PFAS by ID SOP**	**6.4**	**J**	**7.1**	**0.66**	**ng/L**	**1**
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	**2355-31-9**	**PFAS by ID SOP**	**3.8**	**J**	**7.1**	**0.82**	**ng/L**	**1**
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.86**	**J**	**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	R ND	Q	3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**26**		**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	**307-55-1**	**PFAS by ID SOP**	**0.51**	**J**	**3.5**	**0.42**	**ng/L**	**1**
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**38**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**43**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**14**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**73**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**35**	**Q J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	**2058-94-8**	**PFAS by ID SOP**	**0.79**	**J**	**3.5**	**0.55**	**ng/L**	**1**
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**47**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	201	25-150
13C2_6:2FTS	N	208	25-150
13C2_8:2FTS	N	212	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		58	25-150
13C4_PFBA	N	2.0	25-150
13C4_PFHpA		63	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA	N	10	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-017**

Description: **MW-13-36R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1240** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		75	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		104	25-150
d3-MeFOSAA		106	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-018**

Description: **MW-14-70_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1831	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**81**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**110**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**280**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**270**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	153	25-150
13C2_6:2FTS		106	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		74	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		57	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-018**

Description: **MW-14-70_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
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DL = Detection Limit
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-019**

Description: **MW-12-13_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1841	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	~~Q~~	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**27**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**28**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**59**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**37**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	158	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		68	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		58	25-150
13C6_PFDA		68	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-019**

Description: **MW-12-13_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-020**

Description: **MW-21-133_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1852	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.5**		**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**43**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**61**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**68**		**3.5**	**0.61**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.41**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**110**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**48**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**8.9**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	181	25-150
13C2_6:2FTS		127	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		77	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		43	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		68	25-150
13C5_PFPeA		58	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-020**

Description: **MW-21-133_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-021**

Description: **MW-21-134_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1255** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1902	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.71**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**24**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**29**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.98**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**40**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**27**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.9**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		81	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		79	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-021**

Description: **MW-21-134_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1255** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-022**

Description: **MW-21-135_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1913	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	S	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**47**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**34**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**63**	**S J**	**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**25**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	162	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		57	25-150
13C2_PFTeDA		51	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		68	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		70	25-150
13C5_PFPeA		66	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02057-022**

Description: **MW-21-135_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		67	25-150
13C8_PFOSA		64	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-001**

Description: **EB-06_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0900** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 1945	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**6.7**	**J**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		75	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		71	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-001**

Description: **EB-06_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0900** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		71	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		76	25-150
d3-MeFOSAA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-002**

Description: **MW-22-160_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0950** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2017	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**3.2**	**J**	**6.9**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		109	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		61	25-150
13C2_PFTeDA		62	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-002**

Description: **MW-22-160_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0950** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		68	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-003**

Description: **MW-22-146_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2027	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**2.1**	**J**	**7.2**	**1.8**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.0**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.92**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.7**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.0**	**J**	**3.6**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.77**	**J**	**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.1**	**J**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		88	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-003**

Description: **MW-22-146_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1100** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		79	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-004**

Description: **MW-22-147_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2038	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**2.1**	~~JS~~ J	**6.7**	**1.7**	**ng/L**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	UJ	6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.4**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.6**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	183	25-150
13C2_6:2FTS		139	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		78	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		72	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-004**

Description: **MW-22-147_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1210** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-005**

Description: **MW-22-148_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2110	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.7**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.84**	**J**	**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.64	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		85	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-005**

Description: **MW-22-148_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		81	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-006**

Description: **MW-22-149_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2121	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.91**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.80**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.59**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.56**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		92	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-006**

Description: **MW-22-149_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1435** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-007**

Description: **MW-22-150_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2131	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	177	25-150
13C2_6:2FTS	N	168	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		82	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		36	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		79	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-007**

Description: **MW-22-150_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1550** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		94	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-008**

Description: **MW-22-151_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2142	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.6**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.7**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**17**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	R ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.1**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	155	25-150
13C2_6:2FTS		148	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		31	25-150
13C2_PFTeDA	N	5.0	25-150
13C3_PFBS		68	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		56	25-150
13C4_PFBA		27	25-150
13C4_PFHpA		61	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA		45	25-150
13C6_PFDA		64	25-150
13C7_PFUdA		50	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-008**

Description: **MW-22-151_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1645** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		57	25-150
13C8_PFOSA		50	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		55	25-150
d3-MeFOSAA		63	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-009**

Description: **MW-04-04R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/06/2023 2153	ELC2	11/20/2023 1010	90414

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.85**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.57**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		113	25-150
13C2_6:2FTS		114	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		87	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-009**

Description: **MW-04-04R_103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-010**

Description: **MW-04-06R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/01/2023 2347	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.1**		**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	~~Q~~ UJ	3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	R ~~ND~~	Q	3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	~~Q~~ UJ	3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		107	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA	N	23	25-150
13C2_PFTeDA	N	3.0	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		82	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		47	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-010**

Description: **MW-04-06R_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		69	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		59	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-011**

Description: **MW-20-131_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/01/2023 2358	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**21**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.57**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**28**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**29**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.2**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**45**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**30**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.6**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	191	25-150
13C2_6:2FTS	N	219	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		83	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		35	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-011**

Description: **MW-20-131_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
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E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-012**

Description: **MW-04-05(6)_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1230** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0009	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.2**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**27**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**32**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.82**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**36**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**27**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	182	25-150
13C2_6:2FTS	N	225	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		38	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		57	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-012**

Description: **MW-04-05(6)_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1230** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-013**

Description: **MW-20-132_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0019	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.46**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**29**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**28**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**8.0**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**50**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**29**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**19**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	191	25-150
13C2_6:2FTS	N	231	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		66	25-150
13C4_PFBA		40	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		60	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-013**

Description: **MW-20-132_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1400** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		96	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-014**

Description: **MW-12-11_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1445** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0144	OMNS	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.7**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**0.84**	**J**	**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q UJ	3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	171	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA	N	20	25-150
13C3_PFBS		109	25-150
13C3_PFHxS		119	25-150
13C3-HFPO-DA		118	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		124	25-150
13C5_PFHxA		126	25-150
13C5_PFPeA		107	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-014**

Description: **MW-12-11_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023 1445** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		127	25-150
13C8_PFOS		118	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		116	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-015**

Description: **MW-12-12_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/05/2023 1407	ELC2	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**47**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**12**		**3.5**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**47**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**140**		**3.5**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**7.3**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**110**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**73**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**36**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	173	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS	N	157	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		36	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		60	25-150
13C5_PFPeA		53	25-150
13C6_PFDA		89	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-015**

Description: **MW-12-12_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		76	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-016**

Description: **P6-SB-07_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/02/2023 0216	OMNS	11/22/2023 0850	90560
2	SOP SPE	PFAS by ID SOP	5	12/05/2023 1418	ELC2	11/22/2023 0850	90560

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**300**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**28**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1000**		**17**	**1.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1100**		**17**	**2.9**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**140**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1400**		**17**	**3.5**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**970**		**17**	**2.3**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**62**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	188	25-150	N	195	25-150
13C2_6:2FTS	N	177	25-150	N	156	25-150
13C2_8:2FTS		145	25-150		95	25-150
13C2_PFDoA		91	25-150		72	25-150
13C2_PFTeDA		79	25-150		71	25-150
13C3_PFBS		98	25-150		95	25-150
13C3_PFHxS		104	25-150		85	25-150
13C3-HFPO-DA		88	25-150		94	25-150
13C4_PFBA		56	25-150		86	25-150
13C4_PFHpA		77	25-150		86	25-150
13C5_PFHxA		85	25-150		92	25-150
13C5_PFPeA		72	25-150		95	25-150
13C6_PFDA		109	25-150		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-016**

Description: **P6-SB-07_110123** Matrix: **Aqueous**

Date Sampled: **11/01/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		100	25-150		92	25-150
13C8_PFOA		99	25-150		90	25-150
13C8_PFOS		94	25-150		83	25-150
13C8_PFOSA		114	10-150		87	10-150
13C9_PFNA		103	25-150		90	25-150
d5-EtFOSAA		101	25-150		84	25-150
d3-MeFOSAA		102	25-150		85	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-017**

Description: **DUP-14_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2125	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		80	4.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		80	6.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		80	16	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		80	20	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		80	8.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		80	21	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		80	4.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		80	7.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		80	9.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		40	4.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		40	7.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		40	5.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		40	7.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		40	6.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		40	5.9	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		40	5.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		40	5.2	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		40	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		40	4.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		40	6.9	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		40	4.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		40	8.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		40	5.4	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		40	5.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		40	6.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		40	20	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-017**

Description: **DUP-14_103123** Matrix: **Aqueous**

Date Sampled: **10/31/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		81	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-018**

Description: **EB-04-103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2136	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	~~Q~~	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS	N	151	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		76	25-150
13C3_PFBS		96	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		92	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		81	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK02059-018**

Description: **EB-04-103023** Matrix: **Aqueous**

Date Sampled: **10/30/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/02/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		96	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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Chain of Custody Record

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-001**

Description: **MW-18-93_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1515** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2104	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**18**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.92**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**18**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**25**		**3.4**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.44**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**21**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**54**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**4.7**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**70**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**38**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		116	25-150
13C2_6:2FTS		118	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		92	25-150
13C7_PFUdA		83	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-001**

Description: **MW-18-93_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1515** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-002**

Description: **MW-02-04(3)_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/13/2023 2114	OMNS	11/27/2023 1057	90783

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.4	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.4	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.4	0.81	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.4	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.4	0.45	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.4	0.70	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.4	0.86	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.72	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.66	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.4**		**3.7**	**0.56**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.44	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.3**		**3.7**	**0.64**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.77	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.9**		**3.7**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.49	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.58	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		115	25-150
13C2_6:2FTS		119	25-150
13C2_8:2FTS		72	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		50	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		82	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		96	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-002**

Description: **MW-02-04(3)_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1650** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		80	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-003**

Description: **MW-18-94_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0221	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.6**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.65**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		91	25-150
13C2_PFDoA		64	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		72	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		93	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-003**

Description: **MW-18-94_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 0955** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		87	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-004**

Description: **MW-18-101_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2008	ELC2	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.3	0.46	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.2**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.3	0.37	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.3	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.3	0.69	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.3	0.45	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.3	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		145	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		74	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-004**

Description: **MW-18-101_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-005**

Description: **MW-18-97_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1325** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0253	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.5**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.60**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		123	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		66	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		65	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		73	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-005**

Description: **MW-18-97_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1325** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-006**

Description: **MW-23_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1455** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0314	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		68	25-150
13C2_PFDoA		59	25-150
13C2_PFTeDA		60	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		70	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		66	25-150
13C7_PFUdA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-006**

Description: **MW-23_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1455** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		73	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		67	10-150
13C9_PFNA		67	25-150
d5-EtFOSAA		64	25-150
d3-MeFOSAA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-007**

Description: **MW-91-2R_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0325	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.3**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		130	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		84	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		63	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		71	25-150

LOQ = Limit of Quantitation
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-007**

Description: **MW-91-2R_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1620** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		77	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		73	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-008**

Description: **MW-18-89_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 0935** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0418	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.7	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.7	0.73	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.3	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.8**		**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.9**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.4**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.5**		**3.3**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.3**	**J**	**3.3**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.3**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**6.7**		**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**170**		**3.3**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	194	25-150
13C2_6:2FTS	N	206	25-150
13C2_8:2FTS		143	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		55	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		64	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		69	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		59	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-008**

Description: **MW-18-89_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 0935** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		87	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-009**

Description: **DUP-07_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0429	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.44**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.95**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.9**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.2**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.3**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**12**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.4**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**150**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	204	25-150
13C2_6:2FTS	N	202	25-150
13C2_8:2FTS		148	25-150
13C2_PFDoA		75	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		68	25-150
13C4_PFBA		45	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		65	25-150
13C6_PFDA		90	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-009**

Description: **DUP-07_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-010**

Description: **DUP-09_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0439	OMNS	11/27/2023 1050	90790

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		131	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		79	25-150
13C2_PFDoA		70	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		72	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		72	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-010**

Description: **DUP-09_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		74	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		71	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-011**

Description: **MW-19-111_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1040** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0511	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.2**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	25-150
13C2_6:2FTS		96	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		72	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		42	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		67	25-150
13C6_PFDA		70	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-011**

Description: **MW-19-111_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1040** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		69	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-012**

Description: **MW-19-108_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0521	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.58	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		126	25-150
13C2_6:2FTS		105	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		64	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-012**

Description: **MW-19-108_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		72	10-150
13C9_PFNA		72	25-150
d5-EtFOSAA		67	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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H = Out of holding time
W = Reported on wet weight basis
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-013**

Description: **MW-18-92_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0532	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.73**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		127	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		68	25-150
13C2_PFDoA		54	25-150
13C2_PFTeDA		62	25-150
13C3_PFBS		65	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		69	25-150
13C4_PFBA		43	25-150
13C4_PFHpA		72	25-150
13C5_PFHxA		71	25-150
13C5_PFPeA		64	25-150
13C6_PFDA		66	25-150
13C7_PFUdA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-013**

Description: **MW-18-92_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1245** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		62	10-150
13C9_PFNA		68	25-150
d5-EtFOSAA		60	25-150
d3-MeFOSAA		58	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-014**

Description: **MW-19-107_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2039	ELC2	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	~~Q~~	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.6**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.8**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.7**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.6**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.4**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	220	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		88	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07011-014**

Description: **MW-19-107_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1335** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		77	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Plant 3

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Number

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt			Telephone No. / E-mail: (248)809-4013/ kaitlyn.hunt@arcadis.com	Quote No.
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: X			Analysis (Attach list if more space is needed)	Page 1 of 2
City: Novi	State: MI	Zip Code: 48377	Printed Name: Austin Westhuis		
Project Name: RACER Lansing GWS					YK07013
Project Number: 30171056.0370A	P.O. No.: US3460011578				KES2

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous		No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 kit	Field Filtered	PFAS (Method 537M, EGLE 28 compounds)	Remarks / Cooler I.D.
MW-18-102_110223	11/2/23	1005	G	X				2							2	
MW-18-103_110223	11/2/23	1110	G	X				2							2	
MW-18-104_110223	11/2/23	1200	G	X				2							2	
MW-18-105_110223	11/2/23	1315	G	X				2							2	
MW-19-114_110223	11/2/23	1415	G	X				2							2	
MW-18-98_110223	11/2/23	1510	G	X				2							2	
MW-18-99_110323	11/3/23	1045	G	X				2							2	
MW-19-112_110323	11/3/23	1145	G	X				2							2	
MW-18-88_110323	11/3/23	1250	G	X				2							2	
MW-18-90_110323	11/3/23	1425	G	X				2							2	

Turn Around Time Required (Prior lab approval required for expedited TAT): ☒ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements:

	Date	Time		Date	Time
1. Relinquished by: Austin Westhuis/Arcadis	11/6/23	1630	1. Received by: FedEx	11/6/23	1630
2. Relinquished by:	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by	11.7.23	950	4. Laboratory Received by	11.7.23	950

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY: Received on Ice (Check) ☑ Y ☐ N ☐ Ice Pack

Receipt Temp: 3.2 °C

Temp. Blank: ☐ Y / ☒ N

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Plant 3

Chain of Custody Record

Pace Analytical Services, LLC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Number YK07013

KES2

| | | |

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-001**

Description: **MW-18-102_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0653	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	25-150
13C2_6:2FTS		87	25-150
13C2_8:2FTS		71	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		69	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		66	25-150
13C4_PFHpA		71	25-150
13C5_PFHxA		72	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-001**

Description: **MW-18-102_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1005** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		76	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		72	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-002**

Description: **MW-18-103_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1110** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0703	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**11**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**13**		**3.5**	**0.52**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**190**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.95**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.6**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**8.8**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		83	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		85	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		86	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-002**
Description: **MW-18-103_110223**
Matrix: **Aqueous**
Date Sampled: **11/02/2023 1110**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		93	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-003**

Description: **MW-18-104_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1200** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0714	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.44**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.1**		**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		73	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		72	25-150
13C4_PFBA		57	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-003**
Description: **MW-18-104_110223**
Matrix: **Aqueous**
Date Sampled: **11/02/2023 1200**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		75	25-150
13C8_PFOSA		78	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		66	25-150
d3-MeFOSAA		65	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-004**

Description: **MW-18-105_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1315** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0735	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.72**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.6**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		106	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		67	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		67	25-150
13C3_PFHxS		63	25-150
13C3-HFPO-DA		66	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		68	25-150
13C5_PFHxA		74	25-150
13C5_PFPeA		71	25-150
13C6_PFDA		69	25-150
13C7_PFUdA		66	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-004**

Description: **MW-18-105_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1315** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		73	25-150
13C8_PFOS		68	25-150
13C8_PFOSA		73	10-150
13C9_PFNA		72	25-150
d5-EtFOSAA		65	25-150
d3-MeFOSAA		68	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
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J = Estimated result < LOQ and ≥ DL
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-005**

Description: **MW-19-114_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0746	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.8**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		89	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		72	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		75	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		68	25-150
13C4_PFHpA		76	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		76	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-005**

Description: **MW-19-114_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1415** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-006**

Description: **MW-18-98_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0756	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.84**	**J**	**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.79**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**20**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.3**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.3**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.1**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.3**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**180**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		71	25-150
13C4_PFBA		44	25-150
13C4_PFHpA		66	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		78	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-006**

Description: **MW-18-98_110223** Matrix: **Aqueous**

Date Sampled: **11/02/2023 1510** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		82	25-150
13C8_PFOS		70	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-007**

Description: **MW-18-99_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/30/2023 0817	OMNS	11/27/2023 2036	90867

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	~~Q~~	6.8	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**1.2**	**J**	**3.4**	**0.42**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**0.99**	**J**	**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.1**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.4**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.0**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.5**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**69**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	195	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		66	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		80	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		48	25-150
13C4_PFHpA		74	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		73	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-007**

Description: **MW-18-99_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1045** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-008**

Description: **MW-19-112_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1145** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0657	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		80	4.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		80	6.6	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		80	16	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		80	20	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		80	8.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		80	21	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		80	4.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		80	7.5	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		80	9.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		40	4.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		40	7.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		40	5.0	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		40	7.1	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		40	6.1	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		40	5.9	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		40	5.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		40	5.2	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		40	4.7	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		40	4.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		40	6.9	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		40	4.6	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		40	8.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		40	5.4	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		40	6.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		40	5.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		40	6.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		40	20	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150
13C2_6:2FTS		86	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		68	25-150
13C2_PFTeDA		72	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		76	25-150
13C4_PFBA		56	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		77	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		71	25-150
13C7_PFUdA		69	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **YK07013-008**
Description: **MW-19-112_110323**
Matrix: **Aqueous**
Date Sampled: **11/03/2023 1145**
Project Name: **RACER Lansing GWS**
Date Received: **11/07/2023**
Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		75	25-150
13C8_PFOS		70	25-150
13C8_PFOSA		67	10-150
13C9_PFNA		71	25-150
d5-EtFOSAA		69	25-150
d3-MeFOSAA		69	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-009**

Description: **MW-18-88_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0707	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.0	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**3.0**	**J**	**3.5**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**6.0**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.5**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**9.7**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**320**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	184	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		62	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		74	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		73	25-150
13C5_PFPeA		65	25-150
13C6_PFDA		72	25-150
13C7_PFUdA		65	25-150

LOQ = Limit of Quantitation
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Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-009**

Description: **MW-18-88_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1250** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		74	25-150
13C8_PFOS		67	25-150
13C8_PFOSA		68	10-150
13C9_PFNA		73	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0718	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	5	01/09/2024 2112	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.6	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**22**		**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**20**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**38**	~~Q~~ J	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.8**		**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.5**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	~~Q~~	3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1200**	~~E~~ J	**3.6**	**1.8**	**ng/L**	~~1~~ 2

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	213	25-150	H	101	25-150
13C2_6:2FTS	N	201	25-150	H	114	25-150
13C2_8:2FTS	N	197	25-150	H	97	25-150
13C2_PFDoA		79	25-150	H	64	25-150
13C2_PFTeDA		66	25-150	H	62	25-150
13C3_PFBS		74	25-150	H	70	25-150
13C3_PFHxS		69	25-150	H	76	25-150
13C3-HFPO-DA		55	25-150	H	60	25-150
13C4_PFBA	N	2.0	25-150	HN	2.0	25-150
13C4_PFHpA		65	25-150	H	75	25-150
13C5_PFHxA		65	25-150	H	64	25-150
13C5_PFPeA	N	9.0	25-150	HN	12	25-150
13C6_PFDA		78	25-150	H	86	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		78	25-150	H	63	25-150
13C8_PFOA		78	25-150	H	80	25-150
13C8_PFOS		69	25-150	H	69	25-150
13C8_PFOSA		73	10-150	H	73	10-150
13C9_PFNA		74	25-150	H	71	25-150
d5-EtFOSAA		96	25-150	H	78	25-150
d3-MeFOSAA		91	25-150	H	71	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0718	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	5	01/09/2024 2112	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	33	2.0	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	33	2.8	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	33	6.7	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	33	8.3	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H	33	3.6	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	33	8.7	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	33	2.0	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	33	3.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	33	3.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	H	17	1.7	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	17	3.2	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**20**	**H**	**17**	**2.1**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	17	3.0	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	17	2.6	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	17	2.5	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**20**	**H**	**17**	**2.3**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	HQ	17	2.5	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	17	2.2	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	17	2.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.4**	**HJ**	**17**	**1.9**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.3**	**HJ**	**17**	**2.9**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	17	1.9	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**	**H**	**17**	**3.5**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	HQ	17	2.3	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	17	2.5	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H	17	2.2	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	17	2.6	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1200**	**H**	**17**	**8.4**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	213	25-150	H	101	25-150
13C2_6:2FTS	N	201	25-150	H	114	25-150
13C2_8:2FTS	N	197	25-150	H	97	25-150
13C2_PFDoA		79	25-150	H	64	25-150
13C2_PFTeDA		66	25-150	H	62	25-150
13C3_PFBS		74	25-150	H	70	25-150
13C3_PFHxS		69	25-150	H	76	25-150
13C3-HFPO-DA		55	25-150	H	60	25-150
13C4_PFBA	N	2.0	25-150	HN	2.0	25-150
13C4_PFHpA		65	25-150	H	75	25-150
13C5_PFHxA		65	25-150	H	64	25-150
13C5_PFPeA	N	9.0	25-150	HN	12	25-150
13C6_PFDA		78	25-150	H	86	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-010**

Description: **MW-18-90_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1425** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		78	25-150	H	63	25-150
13C8_PFOA		78	25-150	H	80	25-150
13C8_PFOS		69	25-150	H	69	25-150
13C8_PFOSA		73	10-150	H	73	10-150
13C9_PFNA		74	25-150	H	71	25-150
d5-EtFOSAA		96	25-150	H	78	25-150
d3-MeFOSAA		91	25-150	H	71	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-011**

Description: **MW-18-100_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1535** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0357	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**0.61**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.8**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.0**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.3**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.8**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.9**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		119	25-150
13C2_6:2FTS		101	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		87	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		77	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		83	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-011**

Description: **MW-18-100_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1535** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	25-150
13C8_PFOS		87	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		86	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-012**

Description: **MW-18-95_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1630** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0408	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.4**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.62**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**55**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	219	25-150
13C2_6:2FTS	N	181	25-150
13C2_8:2FTS		114	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		78	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-012**

Description: **MW-18-95_110323** Matrix: **Aqueous**

Date Sampled: **11/03/2023 1630** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		91	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-013**

Description: **MW-18-91_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0542	OMNS	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.8**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.9**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.4**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.5**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**52**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	175	25-150
13C2_6:2FTS	N	230	25-150
13C2_8:2FTS	N	206	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		69	25-150
13C3_PFBS		65	25-150
13C3_PFHxS		69	25-150
13C3-HFPO-DA		60	25-150
13C4_PFBA		33	25-150
13C4_PFHpA		65	25-150
13C5_PFHxA		63	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		78	25-150
13C7_PFUdA		77	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-013**

Description: **MW-18-91_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1130** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		71	25-150
13C8_PFOSA		70	10-150
13C9_PFNA		74	25-150
d5-EtFOSAA		95	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-014**

Description: **UNK-15_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/16/2023 0553	OMNS	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	10	12/22/2023 1458	ELC2	11/28/2023 1053	90904

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**13**		**3.4**	**0.43**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**16**		**3.4**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**15**		**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**3.9**		**3.4**	**0.45**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**6.3**		**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**5.2**		**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**24**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.0**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1400**		**34**	**17**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	170	25-150		125	25-150
13C2_6:2FTS	N	177	25-150		100	25-150
13C2_8:2FTS		142	25-150		89	25-150
13C2_PFDoA		68	25-150		72	25-150
13C2_PFTeDA		58	25-150		65	25-150
13C3_PFBS		66	25-150		83	25-150
13C3_PFHxS		69	25-150		82	25-150
13C3-HFPO-DA		62	25-150		88	25-150
13C4_PFBA		39	25-150		79	25-150
13C4_PFHpA		63	25-150		83	25-150
13C5_PFHxA		62	25-150		88	25-150
13C5_PFPeA		55	25-150		90	25-150
13C6_PFDA		75	25-150		83	25-150

LOQ = Limit of Quantitation
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E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-014**

Description: **UNK-15_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1215** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150		70	25-150
13C8_PFOA		74	25-150		77	25-150
13C8_PFOS		62	25-150		73	25-150
13C8_PFOSA		70	10-150		74	10-150
13C9_PFNA		68	25-150		78	25-150
d5-EtFOSAA		86	25-150		67	25-150
d3-MeFOSAA		83	25-150		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2111	ELC2	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	50	01/10/2024 1614	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	Q	6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	Q	6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	Q	6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	Q	6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	Q	6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	Q	6.8	0.80	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	Q	3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	Q	3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	Q	3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	Q	3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	Q	3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	Q	3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	Q	3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	Q	3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	Q	3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	Q	3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	Q	3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	Q	3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	Q	3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	Q	3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	Q	3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	Q	3.4	1.7	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	0.00	25-150	H	102	25-150
13C2_6:2FTS	N	0.00	25-150	H	90	25-150
13C2_8:2FTS	N	0.00	25-150	H	84	25-150
13C2_PFDoA	N	0.00	25-150	H	80	25-150
13C2_PFTeDA	N	0.00	25-150	H	80	25-150
13C3_PFBS	N	0.00	25-150	H	77	25-150
13C3_PFHxS	N	0.00	25-150	H	95	25-150
13C3-HFPO-DA	N	0.00	25-150	H	88	25-150
13C4_PFBA	N	0.00	25-150	H	81	25-150
13C4_PFHpA	N	0.00	25-150	H	81	25-150
13C5_PFHxA	N	0.00	25-150	H	83	25-150
13C5_PFPeA	N	0.00	25-150	H	83	25-150
13C6_PFDA	N	0.00	25-150	H	84	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA	N	0.00	25-150	H	84	25-150
13C8_PFOA	N	0.00	25-150	H	81	25-150
13C8_PFOS	N	0.00	25-150	H	90	25-150
13C8_PFOSA	N	0.00	10-150	H	84	10-150
13C9_PFNA	N	0.00	25-150	H	81	25-150
d5-EtFOSAA	N	0.00	25-150	H	95	25-150
d3-MeFOSAA	N	0.00	25-150	H	88	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/18/2023 2111	ELC2	11/28/2023 1053	90904
2	SOP SPE	PFAS by ID SOP	50	01/10/2024 1614	ELC2	12/21/2023 0314	92812

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H UJ	350	21	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H UJ	350	29	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H UJ	350	70	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H UJ	350	87	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H UJ	350	38	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H UJ	350	90	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H UJ	350	21	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H UJ	350	33	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H UJ	350	40	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**95**	**HJ J**	**170**	**18**	**ng/L**	**2**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H UJ	170	34	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**330**	**H J**	**170**	**22**	**ng/L**	**2**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H UJ	170	31	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H UJ	170	27	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**310**	**H J**	**170**	**26**	**ng/L**	**2**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1400**	**H J**	**170**	**24**	**ng/L**	**2**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND	H UJ	170	26	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H UJ	170	23	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H UJ	170	20	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	H UJ	170	19	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**40**	**HJ J**	**170**	**30**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H UJ	170	20	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**100**	**HJ J**	**170**	**36**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	H UJ	170	24	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H UJ	170	26	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	H UJ	170	23	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H UJ	170	27	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**9800**	**H J**	**170**	**87**	**ng/L**	**2**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	0.00	25-150	H	102	25-150
13C2_6:2FTS	N	0.00	25-150	H	90	25-150
13C2_8:2FTS	N	0.00	25-150	H	84	25-150
13C2_PFDoA	N	0.00	25-150	H	80	25-150
13C2_PFTeDA	N	0.00	25-150	H	80	25-150
13C3_PFBS	N	0.00	25-150	H	77	25-150
13C3_PFHxS	N	0.00	25-150	H	95	25-150
13C3-HFPO-DA	N	0.00	25-150	H	88	25-150
13C4_PFBA	N	0.00	25-150	H	81	25-150
13C4_PFHpA	N	0.00	25-150	H	81	25-150
13C5_PFHxA	N	0.00	25-150	H	83	25-150
13C5_PFPeA	N	0.00	25-150	H	83	25-150
13C6_PFDA	N	0.00	25-150	H	84	25-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YK07013-015**

Description: **CH-14-RO_110423** Matrix: **Aqueous**

Date Sampled: **11/04/2023 1320** Project Name: **RACER Lansing GWS**

Date Received: **11/07/2023** Project Number: **30171056**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA	N	0.00	25-150	H	84	25-150
13C8_PFOA	N	0.00	25-150	H	81	25-150
13C8_PFOS	N	0.00	25-150	H	90	25-150
13C8_PFOSA	N	0.00	10-150	H	84	10-150
13C9_PFNA	N	0.00	25-150	H	81	25-150
d5-EtFOSAA	N	0.00	25-150	H	95	25-150
d3-MeFOSAA	N	0.00	25-150	H	88	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
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Racer – Lansing Plant 2,3&6

Data Review

Lansing, Michigan

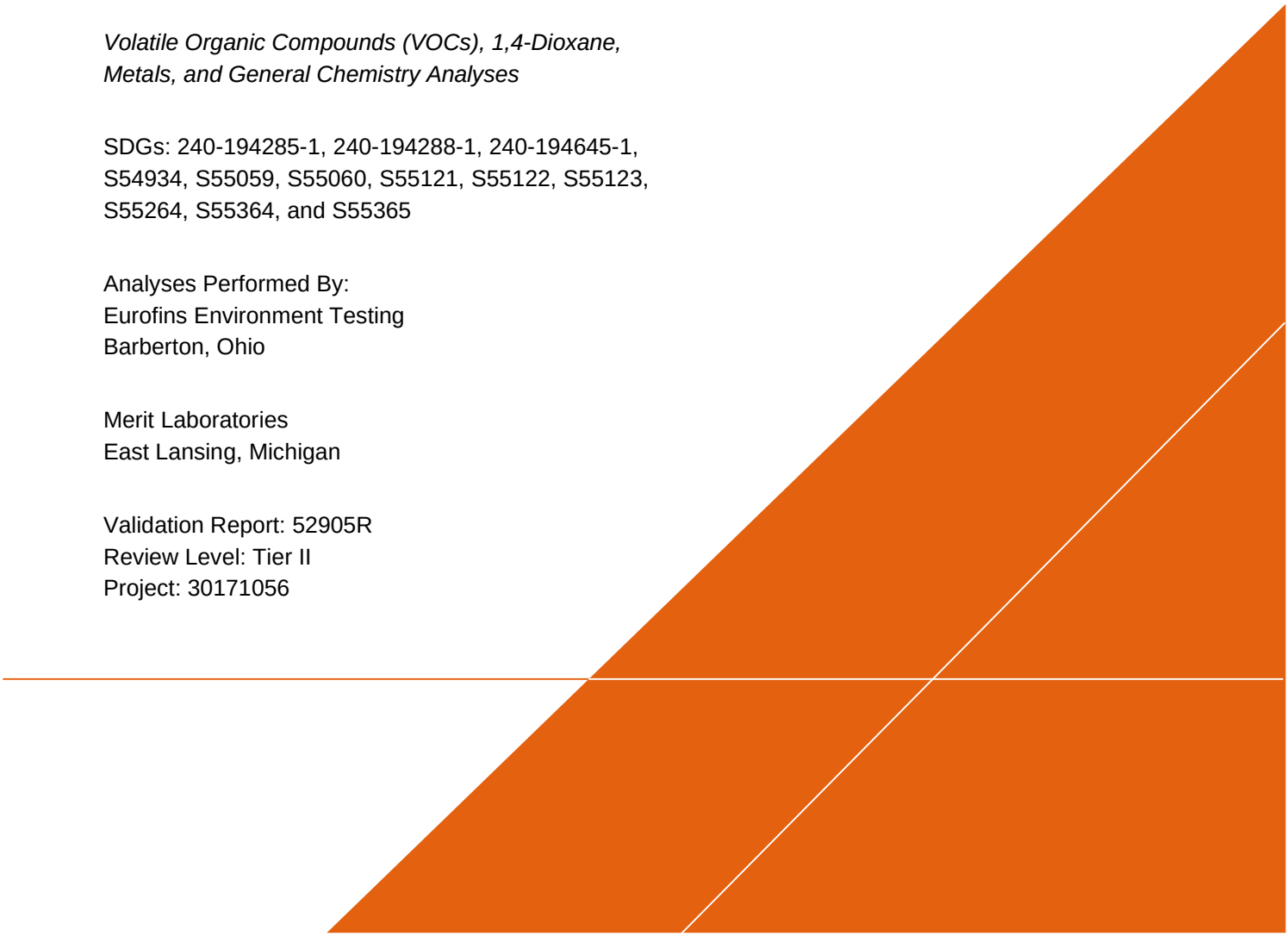
Volatile Organic Compounds (VOCs), 1,4-Dioxane, Metals, and General Chemistry Analyses

SDGs: 240-194285-1, 240-194288-1, 240-194645-1, S54934, S55059, S55060, S55121, S55122, S55123, S55264, S55364, and S55365

Analyses Performed By:
Eurofins Environment Testing
Barberton, Ohio

Merit Laboratories
East Lansing, Michigan

Validation Report: 52905R
Review Level: Tier II
Project: 30171056



Summary

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) 240-194285-1, 240-194288-1, 240-194645-1, S54934, S55059, S55060, S55121, S55122, S55123, S55264, S55364, and S55365 for samples collected in association with the Plants 2, 3 and 6 sites in Lansing Michigan. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data as reported by the laboratory were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain-of-custody (COC) records. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOCs	1,4-Dx	Metals	Misc.
TWP-90-04_102523	240-194285-1	Water	10/25/2023			X		
TWP-90-05_102523	240-194285-2	Water	10/25/2023			X		
FB-01_102523	240-194285-3	Water	10/25/2023			X		
TWP-90-03_102523	240-194285-4	Water	10/25/2023			X		
DUP-01_102523	240-194285-5	Water	10/25/2023	TWP-90-04_102523		X		
MW-12-05R_102523	240-194288-1	Water	10/25/2023			X		
MW-12-06_102523	240-194288-2	Water	10/25/2023			X		
MW-17-87_102523	240-194288-3	Water	10/25/2023			X		
MW-19-118D_102523	240-194288-4	Water	10/25/2023			X		
MW-19-118S_102523	240-194288-5	Water	10/25/2023			X		
MW-13-44_102523	240-194288-6	Water	10/25/2023			X		
MW-19-125_102523	240-194288-7	Water	10/25/2023			X		
DUP-06_102523	240-194288-8	Water	10/25/2023	MW-13-44_102523		X		
MW-19-119D_110123	240-194645-1	Water	11/1/2023			X		
MW-19-119S_110123	240-194645-2	Water	11/1/2023			X		
MW-13-28_110123	240-194645-3	Water	11/1/2023			X		
MW-23-161_102423	S54934.01	Water	10/24/2023		X	X		
MW-23-162_102423	S54934.02	Water	10/24/2023		X	X		
MW-23-163_102423	S54934.03	Water	10/24/2023		X	X		
MW-22-155_102423	S54934.04	Water	10/24/2023		X	X		
MW-14-58R_102423	S54934.05	Water	10/24/2023		X	X		
MW-22-153_102423	S54934.06	Water	10/24/2023		X	X		
MW-22-156_102423	S54934.07	Water	10/24/2023		X	X		
MW-22-157_102423	S54934.08	Water	10/24/2023		X	X		
DUP-03_102423	S54934.09	Water	10/24/2023	MW-23-163_102423	X	X		
Trip Blank	S54934.10	Water	10/24/2023		X			
MW-14-61_102623	S55059.01	Water	10/26/2023		X	X		X
MW-19-121_102623	S55059.02	Water	10/26/2023			X		X
TW-15-12_102623	S55059.03	Water	10/26/2023			X		X

DATA USABILITY SUMMARY REPORT

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOCs	1,4-Dx	Metals	Misc.
MW-19-123_102623	S55059.04	Water	10/26/2023			X		X
MW-20-128_102623	S55059.05	Water	10/26/2023			X		X
PW-14-02_102623	S55059.06	Water	10/26/2023			X		
TW-14-02_102623	S55059.07	Water	10/26/2023			X		
MW-20-127_102623	S55059.08	Water	10/26/2023			X		X
Dup-05_102623	S55059.09	Water	10/26/2023	MW-19-121_102623		X		X
MW-21-139_102523	S55059.10	Water	10/25/2023			X		
P2-MW-04_102523	S55059.11	Water	10/25/2023			X		
MW-14-59_102523	S55059.12	Water	10/25/2023			X		
MW-14-60_102623	S55059.13	Water	10/26/2023			X		
MW-14-62_102623	S55059.14	Water	10/26/2023			X		
MW-14-57_102623	S55059.15	Water	10/26/2023			X		
MW-16-76_102623	S55059.16	Water	10/26/2023			X		
MW-13-29_102623	S55060.01	Water	10/26/2023			X		X
TW-14-06_102623	S55060.02	Water	10/26/2023			X		X
Dup-10_102623	S55060.03	Water	10/26/2023	MW-13-29_102623		X		X
MW-17-86_102723	S55121.01	Water	10/27/2023			X		
MW-16-82_102723	S55121.02	Water	10/27/2023			X		
MW-19-117_102723	S55121.03	Water	10/27/2023			X		
MW-19-116_102723	S55121.04	Water	10/27/2023			X		
MW-19-115_102723	S55121.05	Water	10/27/2023			X		
MW-16-74_102723	S55121.06	Water	10/27/2023			X		
MW-16-81_102723	S55121.09	Water	10/27/2023			X		
MW-15-72_102723	S55121.10	Water	10/27/2023			X		
MW-13-43_102823	S55121.11	Water	10/28/2023			X		
MW-19-120_102823	S55121.12	Water	10/28/2023		X	X		
MW-13-45_102823	S55121.13	Water	10/28/2023			X		
MW-16-84_102823	S55121.14	Water	10/28/2023		X	X		
MW-16-75_102823	S55121.17	Water	10/28/2023			X		
MW-16-77_102823	S55121.18	Water	10/28/2023			X		
MW-16-78_102823	S55121.19	Water	10/28/2023			X		
MW-14-63_102723	S55122.01	Water	10/27/2023			X		
MW-14-56_102723	S55122.02	Water	10/27/2023			X		
MW-20-130_102723	S55122.03	Water	10/27/2023			X		
MW-21-140_102823	S55122.04	Water	10/28/2023			X		
MW-16-85_102823	S55122.05	Water	10/28/2023			X		
MW-16-80_102823	S55122.06	Water	10/28/2023			X		
DUP-04_102723	S55122.07	Water	10/27/2023	MW-14-56_102723		X		
MW-22-152_102723	S55123.01	Water	10/27/2023		X			

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOCs	1,4-Dx	Metals	Misc.
MW-22-154_102723	S55123.02	Water	10/27/2023		X			
DUP-16_102723	S55123.03	Water	10/27/2023	MW-22-152_102723	X			
Trip Blank	S55123.04	Water	10/27/2023		X			
MW-21-141_103023	S55263.01	Water	10/30/2023			X		
MW-02-02(6)_103023	S55263.02	Water	10/30/2023			X		
MW-03-05_103023	S55263.03	Water	10/30/2023			X		
MW-03-06_103023	S55263.04	Water	10/30/2023			X		
MW-04-05(6)_103123	S55263.05	Water	10/31/2023		X			
Trip Blank	S55263.06	Water	10/30/2023		X			
DUP-11_103023	S55263.07	Water	10/30/2023	MW-03-05_103023		X		
DUP-13_103023	S55263.08	Water	10/30/2023	MW-21-141_103023		X		
PW-14-01_103023	S55264.01	Water	10/30/2023			X		
MW-20-129_103023	S55264.02	Water	10/30/2023			X		
MW-19-122_103023	S55264.03	Water	10/30/2023			X		
MW-19-124_103023	S55264.04	Water	10/30/2023			X		
MW-21-142_103023	S55264.05	Water	10/30/2023			X		
MW-20-126_103023	S55264.06	Water	10/30/2023			X		
MW-12-21_110123	S55364.01	Water	11/1/2023			X		
MW-13-22_110123	S55364.04	Water	11/1/2023			X		
MW-13-48_110223	S55364.05	Water	11/2/2023			X		
MW-13-34_110223	S55364.06	Water	11/2/2023			X		
AS-19-A07_110223	S55364.07	Water	11/2/2023			X		
AS-19-A06_110223	S55364.08	Water	11/2/2023			X		
TW-15-11_110223	S55364.09	Water	11/2/2023			X		
PW-14-03R_110223	S55364.10	Water	11/2/2023			X		
MW-13-27_110123	S55365.01	Water	11/1/2023			X		
MW-13-23_110123	S55365.02	Water	11/1/2023			X		
MW-13-25_110223	S55365.03	Water	11/2/2023			X		
MW-13-46_110223	S55365.06	Water	11/2/2023			X		
Dup-08_110223	S55365.07	Water	11/2/2023	MW-13-46_110223		X		

Notes:

VOCs = Volatile Organic Compounds

1,4-Dx = 1,4-Dioxane

Misc. = Miscellaneous analyses

As specified on the COCs, samples MW-16-74_102723, MW-16-84_102823, MW-12-21_110123, and MW-13-25_110223 were used in the matrix spike/matrix spike duplicate (MS/MSD) analysis.

Analytical Data Package Documentation

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of quality assurance (QA) or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Organic Analysis Introduction

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method 522 and SW-846 Methods 8260C and 8260B with selected ion monitoring (SIM). The data were reviewed in accordance with the following guidance documents:

- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (EPA 540-R-2017-002), dated January 2020 (with reference, as appropriate, to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999).
- Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  J The reported value was obtained from a reading less than the reporting limit but greater than or equal to the method detection limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

R The sample results are rejected as unusable. The compound may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

Volatile Organic Compound (VOC) Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
VOCs by SW-846 8260C or 8260B-SIM	Water	Preserved: 14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl
		Unpreserved: 7 days from collection to analysis	Cool to < 6 °C
	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to < 6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks, and equipment rinse blanks, and trip blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Equipment and field blanks also measure contamination of samples during field operations. Trip blanks also measure contamination during shipping and storage.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Sample results less than the BAL were qualified as documented in the following table.

SDG	Sample	Analyte	Sample Result	Qualification
S55059	MW-20-128_102623 TW-14-02_102623 MW-21-139_102523 MW-14-57_102623	1,4-Dioxane	Detected sample results > RL and < BAL	"UB" at detected sample concentration
S55121	MW-16-82_102723 MW-16-74_102723 MW-16-75_102823 MW-16-77_102823 MW-16-78_102823	1,4-Dioxane		
S55122	MW-14-63_102723	1,4-Dioxane		
S55264	PW-14-01_103023 MW-19-122_103023	1,4-Dioxane		

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All sample analyses exhibited surrogate recoveries within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

Samples MW-19-119D_110123, MW-16-74_102723, MW-16-84_102823, MW-12-21_110123, and MW-13-25_110223 were used in the MS/MSD analyses. The MS/MSD analyses exhibited acceptable results.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analyses exhibited acceptable results.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. The control limits of 30% for water matrices and 50% for soil and sediment matrices are applied to the RPDs between the primary and field duplicate sample results. In the instance when the parent and duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL for water matrices or three times to RL for soil and sediment matrices is applied to the difference between the results.

Results for the field duplicate sample results are summarized in the following tables.

Sample and Field Duplicate Sample: MW-23-163_102423 and DUP-03_102423						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	12	56	129.4 %	N/A	1.0	Exceedance

Sample and Field Duplicate Sample: MW-19-121_102623 and Dup-05_102623						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	1.0 U	1.0 U	N/A	N/A	1.0	Acceptable

Sample and Field Duplicate Sample: MW-13-29_102623 and Dup-10_102623						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	7.0	7.0	0.0 %	N/A	1.0	Acceptable

Sample and Field Duplicate Sample: MW-14-56_102723 and DUP-04_102723						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	17	14	19.4 %	N/A	1.0	Acceptable

Sample and Field Duplicate Sample: MW-22-152_102723 and DUP-16_102723						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
All compounds	U	U	N/A	N/A	Varies	Acceptable

Sample and Field Duplicate Sample: MW-21-141_103023 and DUP-13_103023						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	1.0 U	1.0 U	N/A	N/A	1.0	Acceptable

Sample and Field Duplicate Sample: MW-03-05_103023 and DUP-11_103023						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	1.0 U	1.0 U	N/A	N/A	1.0	Acceptable

Sample and Field Duplicate Sample: MW-13-46_110223 and Dup-08_110223						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	1.0 U	1.0 U	N/A	N/A	1.0	Acceptable

Notes: N/A = Not applicable
U = Not detected
J = Estimated (result is < reporting limit)

Most of the field duplicate samples exhibited acceptable results. The 1,4-dioxane results for MW-23-163_102423 and DUP-03_102423 exhibited an RPD greater than the control limit. The 1,4-dioxane results for MW-23-163_102423 and DUP-03_102423 were qualified as estimated.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for VOCs

VOCs: SW-846 8260B-SIM and 8260C	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Gas Chromatography/Mass Spectrometry (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (Units)		X		X	
Blanks					
A. Method Blanks		X	X		
B. Equipment and/or Field Blanks		X		X	
Matrix Spike (MS) Accuracy (%R)		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD RPD		X		X	
Laboratory Duplicate Sample RPD	X				X
Field Duplicate Sample RPD		X	X		
Dilution Factor		X		X	

Notes:
%R = Percent recovery
RPD = Relative percent difference
%RSD = Relative standard deviation
%D = Percent difference

Semivolatile Organic Compound (SVOC) Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
1,4-Dioxane by USEPA 522	Water	28 days from collection to extraction and 28 days from extraction to analysis	Cool to < 6 °C; Na_2SO_3 and $NaHSO_3$

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks, and equipment rinse blanks, and trip blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Equipment and field blanks also measure contamination of samples during field operations. Trip blanks also measure contamination during shipping and storage.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

1,4-Dioxane was not detected above the MDL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All sample analyses exhibited surrogate recoveries within the control limits.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

Sample MW-19-119D_110123 was used in the MS/MSD analysis. The MS/MSD analysis exhibited acceptable results.

5. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

The LCS/LCSD analyses exhibited acceptable results.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. The control limits of 30% for water matrices and 50% for soil and sediment matrices are applied to the RPDs between the primary and field duplicate sample results. In the instance when the parent and duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL for water matrices or three times to RL for soil and sediment matrices is applied to the difference between the results.

Results for the field duplicate sample results are summarized in the following tables.

Sample and Field Duplicate Sample: TWP-90-04_102523 and DUP-01_102523						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	0.24	0.30	N/A	0.06	0.2	Acceptable

Sample and Field Duplicate Sample: MW-13-44_102523 and DUP-06_102523						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
1,4-Dioxane	5.7	5.0	13.1 %	N/A	0.2	Acceptable

Note: N/A = Not applicable

The field duplicate samples exhibited acceptable results.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for SVOCs

1,4-Dioxane: USEPA 522	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Gas Chromatography/Mass Spectrometry (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (Units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment and/or Field Blanks		X		X	
Matrix Spike (MS) Accuracy (%R)		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD RPD		X		X	
Laboratory Duplicate Sample RPD	X				X
Field Duplicate Sample RPD		X		X	
Dilution Factor		X		X	

Notes:
%R = Percent recovery
RPD = Relative percent difference
%RSD = Relative standard deviation
%D = Percent difference

Inorganic Analysis Introduction

Analyses were performed according to Standard Methods (SM) 4500-NO3-F, 4500-N/NH3-G, 4500-NH3-G, and 4500-P-E. The data were reviewed in accordance with the following guidance documents:

- USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review, OLEM 9240.1-66 (November 2020) (with reference, as appropriate, to the historical USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, October 2004).
- Quality Assurance Project Plan, Revitalizing Auto Communities Environmental Response (RACER) Trust, August 2011.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  J The reported value was obtained from a reading less than the reporting limit but greater than or equal to the method detection limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  R The sample results are rejected as unusable. The compound may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

General Chemistry Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Ammonia-N by SM 4500-NH3	Water	28 days from collection to analysis	Cool to < 6 °C; pH of < 2
Nitrate by SM 4500-NO3-F	Water	48 hours from collection to analysis	Cool to < 6 °C
Phosphorus by SM 4500-P-E	Water	28 days from collection to analysis	Cool to < 6 °C; pH of < 2
Total Kjeldahl Nitrogen (TKN) by SM 4500-N/NH3-G	Water	28 days from collection to analysis	Cool to < 6 °C; pH of < 2

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., laboratory method blanks, and equipment rinse blanks, and trip blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Equipment and field blanks also measure contamination of samples during field operations. Trip blanks also measure contamination during shipping and storage.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Target analytes were not detected above the MDL in the associated blanks; therefore, detected sample results are not associated with blank contamination.

3. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

All analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. When a MSD analysis is performed, the relative percent difference (RPD) between the MS/MSD results must be within the established acceptance limits of 20% for water matrices and 35% for soil matrices.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

Sample MW-14-61_102623 was used in the MS analyses. The MS analyses exhibited acceptable results.

4. Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (RL). A control

limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample analyses exhibited acceptable results.

5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit recoveries between the control limits of 80% and 120%.The LCS analyses exhibited acceptable results.

5. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the overall precision of the field sampling procedures and analytical method. The control limits of 30% for water matrices and 50% for soil and sediment matrices are applied to the RPDs between the primary and field duplicate sample results. In the instance when the parent and duplicate sample concentrations are less than five times the reporting limit (RL), a control limit of two times the RL for water matrices or three times to RL for soil and sediment matrices is applied to the difference between the results.

Results for the field duplicate sample results are summarized in the following tables.

Sample and Field Duplicate Sample: MW-19-121_102623 and Dup-05_102623						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Ammonia	0.02 U	0.06	N/A	0.04	0.02	Acceptable
Total Kjeldahl Nitrogen (TKN)	1.3	9.8	153.2 %	N/A	0.4	Exceedance
Total Phosphorus	10.3	112	166.3 %	N/A	12	Exceedance

Sample and Field Duplicate Sample: MW-13-29_102623 and Dup-10_102623						
Compound	Sample Result	Duplicate Result	RPD	Difference	RL	Evaluation
Ammonia	0.13	0.12	8.0 %	N/A	0.02	Acceptable
Total Kjeldahl Nitrogen (TKN)	0.4	0.2	N/A	0.2	0.1	Acceptable
Total Phosphorus	0.02	0.02	N/A	0.0	0.01	Acceptable

Notes: N/A = Not applicable
U = Not detected
J = Estimated (result is < reporting limit)

The TKN and phosphorus results for MW-19-121_102623 and Dup-05_102623 exhibited an RPD greater than the control limit. The TKN and phosphorus results for MW-19-121_102623 and Dup-05_102623 were qualified as estimated.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for General Chemistry

General Chemistry: Standard Methods	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Various Instruments					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (Units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment and/or Field Blanks	X				X
Matrix Spike (MS) Accuracy (%R)		X		X	
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD RPD	X				X
Laboratory Duplicate Sample RPD		X		X	
Field Duplicate Sample RPD		X	X		
Dilution Factor		X		X	

Notes:
%R = Percent recovery
RPD = Relative percent difference

Validation Performed By: Dennis Dyke

Signature: 

Date: February 14, 2024

Chain Of Custody and Validated Sample Analysis Data Sheets

Eurofins Canton
180 S. Van Buren Ave

Barberton, OH 44203-3543
phone 330.497.9396 fax 330.497.0772

Chain of Custody Record

2.2
2.0

eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Eurofins Environment Testing America

Client Contact	**Project Manager:**	COC No:
Arcadis	Email: tiffany.linder@arcadis.com	**Site Contact: Kaitlyn Hunt**	**Date:**	___1___ of ___1___ COCs
28550 Cabot Drive, Suite 500	**Tel/Fax: (810) 225-1928**	**Lab Contact: Michael DelMonico**	**Carrier:**	TALS Project #:
Novi, MI 48377	**Analysis Turnaround Time**			Sampler:
(248) 994-2240 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
tiffany.linder@arcadis.com, kaitlyn.hunt@arcadis.com	TAT if different from Below Standard			Walk-in Client:
Project Name: RACER Lansing/ 30171056.0470A	☐ 2 weeks			Lab Sampling:
Site: Plant ____ MUNICIPAL	☐ 1 week			Job / SDG No.:
P O #	☐ 2 days ☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	522 - 1,4-Dioxane	Sample Specific Notes:
TWP-90-04_102523	10/25/23	835	G	GW		N	N	X	
TWP-90-05_102523	10/25/23	855	G	GW		N	N	X	
FB-01_102523	10/26/23	910	G	GW		N	N	X	
TWP-90-03_102523	10/25/23	915	G	GW		N	N	X	
DUP-01_102523	10/25/23	—	G	GW		N	N	X	



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____

	Company	Date/Time		Company	Date/Time
Relinquished by:	ARCADIS	10/26/23 16:00	Received by:	EETNC	10/26/23 950
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-04_102523
Date Collected: 10/25/23 08:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.24		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*83*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:07*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-05_102523
Date Collected: 10/25/23 08:55
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.36		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*81*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:20*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: FB-01_102523
Date Collected: 10/25/23 09:10
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*82*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:34*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: TWP-90-03_102523
Date Collected: 10/25/23 09:15
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-4
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/10/23 13:45	11/17/23 01:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/10/23 13:45*	*11/17/23 01:47*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194285-1

Client Sample ID: DUP-01_102523
Date Collected: 10/25/23 00:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194285-5
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.30		0.20	0.092	ug/L		11/10/23 13:45	11/17/23 02:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/10/23 13:45*	*11/17/23 02:01*	*1*

Eurofins Canton
180 S. Van Buren Ave

Barberton, OH 44203-3543
phone 330.497.9396 fax 330.497.0772

Chain of Custody Record

eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Eurofins Environment Testing America

	Project Manager:		COC No:
Client Contact	Email: tiffany.linder@arcadis.com	**Site Contact: Kaitlyn Hunt**	**Date:**	_____ of _____ COCs
Arcadis	**Tel/Fax: (810) 225-1928**	**Lab Contact: Michael DelMonico**	**Carrier:**	TALS Project #:
28550 Cabot Drive, Suite 500	**Analysis Turnaround Time**			Sampler:
Novi, MI 48377	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
(248) 994-2240 Phone	TAT if different from Below Standard			Walk-in Client:
tiffany.linder@arcadis.com, kaitlyn.hunt@arcadis.com	☐ 2 weeks			Lab Sampling:
Project Name: RACER Lansing/ 30171056.0470A	☐ 1 week			
Site: Plant 2	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	522 - 1,4-Dioxane	Sample Specific Notes:
MW-12-058_102523	10/25/23	0950	G	GW	1	N	N	X	
MW-12-06_102523	10/25/23	1100	G	GW	1	N	N	X	
MW-17-87_102523	10/25/23	1235	G	GW	1	N	N	X	
MW-19-118D_102523	10/25/23	1110	G	GW	1	N	N	X	
MW-19-118S_102523	10/25/23	1235	G	GW	1	N	N	X	
MW-13-44_102523	10/25/23	1425	G	GW	1	N	N	X	
MW-19-125_102523	10/25/23	1350	G	GW	1	N	N	X	
Dup-06_102523	10/25/23	—	G	GW	1	N	N	X	

240-194288 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: _____	Corr'd: _____	Therm ID No.: _____
Relinquished by:	Company: Arcadis	Date/Time: 10/25/23 16:00	Received by:	Company: ETNC	Date/Time: 10/26/23 950
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-05R_102523
Date Collected: 10/25/23 09:50
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.21		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*83*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:21*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-12-06_102523
Date Collected: 10/25/23 11:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.12	J	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*72*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:35*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-17-87_102523
Date Collected: 10/25/23 12:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.2		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 18:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*84*		*46 - 130*	*11/14/23 17:00*	*11/16/23 18:48*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-118D_102523
Date Collected: 10/25/23 11:10
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-4
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*81*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:02*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-118S_102523
Date Collected: 10/25/23 12:35
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-5
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.6		0.20	0.092	ug/L		11/14/23 17:00	11/17/23 09:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*77*		*46 - 130*	*11/14/23 17:00*	*11/17/23 09:56*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-13-44_102523
Date Collected: 10/25/23 14:25
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-6
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.7		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:29*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: MW-19-125_102523
Date Collected: 10/25/23 13:50
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-7
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.18	J	0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*92*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:42*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194288-1

Client Sample ID: DUP-06_102523
Date Collected: 10/25/23 00:00
Date Received: 10/26/23 09:50

Lab Sample ID: 240-194288-8
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.0		0.20	0.092	ug/L		11/14/23 17:00	11/16/23 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*75*		*46 - 130*	*11/14/23 17:00*	*11/16/23 19:56*	*1*

4.5/4.7

PLANT-3

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Bill Cubeta	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-113370-40294.1
Client Contact: Alex Villhauer	Phone: 810-355-3642	E-Mail: Michael.DelMonico@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: ARCADIS US Inc	PWSID:			Job #:
Address: 120 N. Washington Square Suite 300 (3rd Floor)	Due Date Requested:			
City: Lansing	TAT Requested (days):			
State, Zip: MI, 48933	Compliance Project: Δ Yes Δ No			
Phone: 810-225-1928(Tel)	PO #: Purchase Order not required			
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001			
Project Name: Racer Lansing method 522	Project #: 24017406			
Site: 30171056-04708	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522-1,4-Dioxane	522 - Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A		
MW-19-1190-110123	11/1/23	1015	G	Water	N	N	X	X		
MW-19-1195-110123	11/1/23	1115	G	Water	N	N	X	X		
MW-13-28-110123	11/1/23	1240	G	Water	N	N	X	X		
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						

240-194645 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		11-1-23 14:00	ARCADIS		11-2-23 10:20	
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119D_110123
Date Collected: 11/01/23 10:15
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-1
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.43		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 18:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*98*		*46 - 130*	*11/21/23 10:00*	*11/22/23 18:49*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-19-119S_110123
Date Collected: 11/01/23 11:15
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-2
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 19:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*	*11/21/23 10:00*	*11/22/23 19:29*	*1*

Client: ARCADIS US Inc
Project/Site: Racer Lansing

Job ID: 240-194645-1

Client Sample ID: MW-13-28_110123
Date Collected: 11/01/23 12:40
Date Received: 11/02/23 10:30

Lab Sample ID: 240-194645-3
Matrix: Water

Method: EPA 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.83		0.20	0.092	ug/L		11/21/23 10:00	11/22/23 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*	*11/21/23 10:00*	*11/22/23 19:43*	*1*

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westmus / [signature]
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☒ OTHER RUSH 1 DAY
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
549341.01	10/24/23	1150	MW-23-161_102423	GW	3		3						✔	✔
.02	10/24/23	1255	MW-23-162_102423	GW	3		3						X	X
.03	10/24/23	1410	MW-23-163_102423	GW	3		3						X	X
.04	10/24/23	1520	MW-22-155_102423	GW	3		3						X	X
.05	10/24/23	1300	MW-14-58R_102423	GW	3		3						X	X
.06	10/24/23	1400	MW-22-153_102423	GW	3		3						X	X
.07	10/24/23	1515	MW-22-156_102423	GW	3		3						X	X
.08	10/24/23	1630	MW-22-157_102423	GW	3		3						X	X
.09	10/24/23	—	DUP-03_102423	GW	3		3						X	X
.10	10/24/23	—	Trip Blank	GW	1		1							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/24/23	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 10/24/23	TIME 1650

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S54934.01
Sample Tag: MW-23-161_102423
Collected Date/Time: 10/24/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 15:30, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	54	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 17:56, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.01 (continued)
Sample Tag: MW-23-161_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 17:56, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.02
Sample Tag: MW-23-162_102423
Collected Date/Time: 10/24/2023 12:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:02, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:15, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.02 (continued)
Sample Tag: MW-23-162_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:15, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.03
Sample Tag: MW-23-163_102423
Collected Date/Time: 10/24/2023 14:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:23, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	12	1		ug/L	1	123-91-1	J

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:36, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.03 (continued)
Sample Tag: MW-23-163_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:36, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.04
Sample Tag: MW-22-155_102423
Collected Date/Time: 10/24/2023 15:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 16:44, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	176	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:56, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.04 (continued)
Sample Tag: MW-22-155_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 18:56, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.05
Sample Tag: MW-14-58R_102423
Collected Date/Time: 10/24/2023 13:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:05, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	194	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:15, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.05 (continued)
Sample Tag: MW-14-58R_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:15, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.06
Sample Tag: MW-22-153_102423
Collected Date/Time: 10/24/2023 14:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:27, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	101	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:34, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	37	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.06 (continued)
Sample Tag: MW-22-153_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:34, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.07
Sample Tag: MW-22-156_102423
Collected Date/Time: 10/24/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 17:48, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	140	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 21:12, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	20	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	280	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	Not detected	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S54934.07 (continued)
Sample Tag: MW-22-156_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 21:12, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	Not detected	10		ug/L	10	100-41-4	Y
p,m-Xylene*	Not detected	20		ug/L	10		Y
o-Xylene	Not detected	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	Not detected	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	Not detected	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	Not detected	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	Not detected	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	Not detected	10		ug/L	10	526-73-8	Y
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	Not detected	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S54934.08
Sample Tag: MW-22-157_102423
Collected Date/Time: 10/24/2023 16:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 18:09, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	115	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:54, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.08 (continued)
Sample Tag: MW-22-157_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 19:54, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.09
Sample Tag: DUP-03_102423
Collected Date/Time: 10/24/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/26/23 18:29, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	56	1		ug/L	1	123-91-1	J

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 20:13, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S54934.09 (continued)
Sample Tag: DUP-03_102423

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 20:13, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S54934.10
Sample Tag: Trip Blank
Collected Date/Time: 10/24/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/26/23 12:01	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 14:58, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S54934.10 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 10/25/23 14:58, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55059.01	10/26/23	1010	MW-14-61_102623	GW	5	1	3		1				X	X	X	X	X
.02	10/26/23	1210	MW-19-121_102623	GW	5	1	3		1				X	X		X	X
.03	10/26/23	1300	TW-15-12_102623	GW	5	1	3		1				X		X	X	X
.04	10/26/23	1405	MW-19-123_102623	GW	5	1	3		1				X		X	X	X
.05	10/26/23	1525	MW-20-128_102623	GW	5	1	3		1				X		X	X	X
.06	10/26/23	1430	PW-14-02_102623	GW	5	1	3		1				X				
.07	10/26/23	1535	TW-14-02_102623	GW	5	1	3		1				X				
.08	10/26/23	1655	MW-20-127_102623	GW	5	1	3		1				X		X	X	X
.09	10/26/23		DUP-05_102623	GW	5	1	3		1				X		X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis ☒ Sampler	DATE 10/26/23	TIME 1745
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/26/23	TIME 1745
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/27/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcott	DATE 10/27/23	TIME 0815
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.

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C.O.C. PAGE # 2 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55059.10	10/25/23	1205	MW-21-139_102523	GW	3		3						X	
.11	10/25/23	1335	P2-MW-04_102523	GW	3		3						X	
.12	10/25/23	1425	MW-14-59_102523	GW	3		3						X	
.13	10/26/23	0955	MW-14-60_102623	GW	3		3						X	
.14	10/26/23	1050	MW-14-62_102623	GW	3		3						X	
.15	10/26/23	1455	MW-14-57_102623	GW	3		3						X	
.16	10/26/23	1645	MW-16-76_102623	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ~~Sampler~~	DATE: 10/26/23	TIME: 1745	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 10/26/23	TIME: 1745	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 10/27/23	TIME: 0815	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Nicoob	DATE: 10/27/23	TIME: 0815	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S55059.01
Sample Tag: MW-14-61_102623
Collected Date/Time: 10/26/2023 10:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/03/23 12:15	NDK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:17, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.1	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 16:48, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:17, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.11	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 15:39, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	13	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 02:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	

Lab Sample ID: S55059.01 (continued)
Sample Tag: MW-14-61_102623

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 02:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55059.01 (continued)

Sample Tag: MW-14-61_102623

Other / Misc.

Method: , Run Date: 10/27/23 15:35, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.02
Sample Tag: MW-19-121_102623
Collected Date/Time: 10/26/2023 12:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:21, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	1.3	0.1		mg/L	4		J

Method: SM4500-NH3 G, Run Date: 11/02/23 15:16, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:23, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	10.3	0.3	0.2	mg/L	25	7723-14-0	J

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:00, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:39, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.03
Sample Tag: TW-15-12_102623
Collected Date/Time: 10/26/2023 13:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:23, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.3	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:18, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:26, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.12	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:21, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:40, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.04
Sample Tag: MW-19-123_102623
Collected Date/Time: 10/26/2023 14:05
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:25, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.1	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:20, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:31, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 16:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	39	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:41, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.05
Sample Tag: MW-20-128_102623
Collected Date/Time: 10/26/2023 15:25
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:31, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	6.7	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:22, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.03	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:35, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	3.3	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:03, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 1	1		ug/L	1	123-91-1	UB

Other / Misc.

Method: , Run Date: 10/27/23 15:43, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S55059.06
Sample Tag: PW-14-02_102623
Collected Date/Time: 10/26/2023 14:30
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:24, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S55059.07
Sample Tag: TW-14-02_102623
Collected Date/Time: 10/26/2023 15:35
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 15:40, Analyst: NDK

Parameter		Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	<	1	1		ug/L	1	123-91-1	UB

Analytical Laboratory Report

Lab Sample ID: S55059.08
Sample Tag: MW-20-127_102623
Collected Date/Time: 10/26/2023 16:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:47, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.7	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:24, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.54	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.05	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 17:46, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	132	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:44, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.09
Sample Tag: Dup-05_102623
Collected Date/Time: 10/26/2023 00:01
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:49, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	9.8	0.4		mg/L	20		J

Method: SM4500-NH3 G, Run Date: 11/02/23 15:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.06	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 16:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	112	12	11	mg/L	1,250	7723-14-0	J

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:01, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:45, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55059.10
Sample Tag: MW-21-139_102523
Collected Date/Time: 10/25/2023 12:05
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 14:37, Analyst: NDK

Parameter		Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	<	1	1		ug/L	1	123-91-1	UB

Lab Sample ID: S55059.11
Sample Tag: P2-MW-04_102523
Collected Date/Time: 10/25/2023 13:35
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 14:57, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	22	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.12
Sample Tag: MW-14-59_102523
Collected Date/Time: 10/25/2023 14:25
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 15:18, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.13
Sample Tag: MW-14-60_102623
Collected Date/Time: 10/26/2023 09:55
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 18:27, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S55059.14
Sample Tag: MW-14-62_102623
Collected Date/Time: 10/26/2023 10:50
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 18:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	70	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S55059.15
Sample Tag: MW-14-57_102623
Collected Date/Time: 10/26/2023 14:55
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 2	~~1~~ 2		ug/L	1	123-91-1	UB

Lab Sample ID: S55059.16
Sample Tag: MW-16-76_102623
Collected Date/Time: 10/26/2023 16:45
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:31, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
www.watertech-inc.com

ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 10:10
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.01

Lab Sample Number: 176408-01

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:35

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
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2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 12:10
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.02

Lab Sample Number: 176408-02

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	5.3	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:39

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 13:00
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.03

Lab Sample Number: 176408-03

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:40

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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To:
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2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 14:05
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.04

Lab Sample Number: 176408-04

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	0.19	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:41

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 15:25
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.05

Lab Sample Number: 176408-05

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:43

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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To:
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2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 16:55
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.08

Lab Sample Number: 176408-06

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	Not Detected	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:44

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

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ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 0:01
Date Received: 10/27/2023
Collected By:
Matrix: Water

Sample ID:
S55059.09

Lab Sample Number: 176408-07

Test Parameter	Result	Units	DL	Method	Analyst	Date
Nitrate-N	6.0	mg/L-N	0.1	SM4500NO3F	CTM	10/27/2023 15:45

Released By: _____ **Date:** 10/30/2023

ABBREVIATIONS:
DL = Lowest reportable level of detection.
CFU = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).
ug/L = Micrograms per liter (= parts per billion).

Plant 3

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C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Colton

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55060.01	10/26/23	10:00	MW-13-29_102623	GW	5	1	3		1				X		X	X	X
.02	10/26/23	11:40	TW-14-06_102623	GW	5	1	3		1				X		X	X	X
.03	10/26/23	—	DUP-10_102623	GW	5	1	3		1				X		X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Arcadis ☒ Sampler	10/26/23	1745
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	10/26/23	1745
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit Drop Box	10/27/23	0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	10/27/23	0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S55060.01
Sample Tag: MW-13-29_102623
Collected Date/Time: 10/26/2023 10:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 14:45, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.4	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:42, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.13	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:04, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 19:52, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:46, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55060.02
Sample Tag: TW-14-06_102623
Collected Date/Time: 10/26/2023 11:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:39, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.8	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:44, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	Not detected	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:11, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.46	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 20:13, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:47, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Analytical Laboratory Report

Lab Sample ID: S55060.03
Sample Tag: Dup-10_102623
Collected Date/Time: 10/26/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
1	250ml Plastic	H2SO4	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Inorganics

Method: SM4500-N/NH3 G, Run Date: 11/03/23 13:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen*	0.2	0.1		mg/L	4		

Method: SM4500-NH3 G, Run Date: 11/02/23 15:46, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Ammonia-N (Undistilled)*	0.12	0.02		mg/L	1	7664-41-7	

Method: SM4500-PE, Run Date: 10/31/23 17:28, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.02	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/06/23 20:34, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Other / Misc.

Method: , Run Date: 10/27/23 15:49, Analyst: Water

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Water Tech
A Testing Laboratory
718 S. Michigan Howell, MI 48843 (517) 548-2505 Fax (517) 548-3434
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WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 10:10
Date Received: 10/27/2023
Collected By:
Sample Point: S55060.01

Sample ID:
S55060
S55060.01

Lab Sample Number: 176409-01

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.30	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:46	MCL=10

Released By: NW **Date:** 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

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WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 12:10
Date Received: 10/27/2023
Collected By:
Sample Point: S550606.02

Sample ID:
S55060
S550606.02

Lab Sample Number: 176409-02

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.27	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:47	MCL=10

Released By: NW

Date: 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

Water Tech
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www.watertech-inc.com

WATER ANALYSIS RESULTS

To:
Merit Laboratories, Inc.
2680 East Lansing Dr.
East Lansing, MI 48823

Date Sampled: 10/26/2023 13:00
Date Received: 10/27/2023
Collected By:
Sample Point: S55060.03

Sample ID:
S55060
S55060.03

Lab Sample Number: 176409-03

Test Parameter	Result	Units	RL	Method	Analysis Date	Maximum Desired Limit
Nitrate-N	0.32	mg/L-N	0.1	SM4500NO3F	10/27/2023 15:49	MCL=10

Released By: NW **Date:** 10/30/2023

Laboratory #23 assigned by the Michigan Department of Environmental Quality for the microbiological and chemical analysis of drinking water.

ABBREVIATIONS:
RL = Lowest reporting level
MCL = Maximum Contaminant Level - The maximum permissible level established by the USEPA and or MDEQ for safe drinking water.
SMCL = Secondary Maximum Contaminant Level - Suggested maximum level established by the USEPA for desirableable water quality.
CFU/100 ml = Colony Forming Units/100 milliliter sample volume.
mg/L = Milligrams per liter (= parts per million).

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000	Special Instructions
55121.01	10/27/23	0955	MW-17-86_102723	GW	3		3						X					
.02	10/27/23	1050	MW-16-82_102723	GW	3		3						X					
.03	10/27/23	1235	MW-19-117_102723	GW	3		3						X					
.04	10/27/23	1350	MW-19-116_102723	GW	3		3						X					
.05	10/27/23	1500	MW-19-115_102723	GW	3		3						X					
.06/.07/.08	10/27/23	1600	MW-16-74_102723	GW	9		9						X					MS/MSD
.09	10/27/23	1340	MW-16-81_102723	GW	3		3						X					
.10	10/27/23	1505	MW-15-72_102723	GW	3		3						X					
.11	10/28/23	845	MW-13-43_102823	GW	3		3						X					
.12	10/28/23	855	MW-19-20_102823	GW	3		3						X					
.13	10/28/23	10:00	MW-13-45_102823	GW	3		3						X					
.14/.15/.16	10/28/23	10:15	MW-16-84_102823	GW	9		9						X					MS/MSD

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
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C.O.C. PAGE # 2 OF 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Brady J. Cogan

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55121.17	10/28/23	1135	MW-16-75_102823	GW	3		3						X				
.18	10/28/23	1305	MW-16-77_102823	GW	3		3						X				
.19	10/28/23	1410	MW-16-78_102823	GW	3		3						X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S55121.01
Sample Tag: MW-17-86_102723
Collected Date/Time: 10/27/2023 09:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:22, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	16	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.02
Sample Tag: MW-16-82_102723
Collected Date/Time: 10/27/2023 10:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 16:43, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 3	~~1~~ 3		ug/L	1	123-91-1	UB

Lab Sample ID: S55121.03
Sample Tag: MW-19-117_102723
Collected Date/Time: 10/27/2023 12:35
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.04
Sample Tag: MW-19-116_102723
Collected Date/Time: 10/27/2023 13:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:26, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.05
Sample Tag: MW-19-115_102723
Collected Date/Time: 10/27/2023 15:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 17:46, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S55121.06
Sample Tag: MW-16-74_102723
Collected Date/Time: 10/27/2023 16:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:08, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 3	~~1~~ 3		ug/L	1	123-91-1	UB

Lab Sample ID: S55121.09
Sample Tag: MW-16-81_102723
Collected Date/Time: 10/27/2023 13:40
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:29, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	99	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.10
Sample Tag: MW-15-72_102723
Collected Date/Time: 10/27/2023 15:05
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 18:50, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	67	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.11
Sample Tag: MW-13-43_102823
Collected Date/Time: 10/28/2023 08:45
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:16, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.12
Sample Tag: MW-19-120_102823
Collected Date/Time: 10/28/2023 08:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 19:32, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	11	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 16:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S55121.12 (continued)
Sample Tag: MW-19-120_102823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 16:42, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S55121.13
Sample Tag: MW-13-45_102823
Collected Date/Time: 10/28/2023 10:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/23 11:48	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 19:53, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	25	1		ug/L	1	123-91-1	

Lab Sample ID: S55121.14
Sample Tag: MW-16-84_102823
Collected Date/Time: 10/28/2023 10:15
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:29	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/07/23 20:14, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	39	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 17:05, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S55121.14 (continued)
Sample Tag: MW-16-84_102823

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/07/23 17:05, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S55121.17
Sample Tag: MW-16-75_102823
Collected Date/Time: 10/28/2023 11:35
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:07, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 2	~~1~~ 2		ug/L	1	123-91-1	UB

Lab Sample ID: S55121.18
Sample Tag: MW-16-77_102823
Collected Date/Time: 10/28/2023 13:05
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:28, Analyst: NDK

Parameter		Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	<	1	1		ug/L	1	123-91-1	UB

Lab Sample ID: S55121.19
Sample Tag: MW-16-78_102823
Collected Date/Time: 10/28/2023 14:10
Matrix: Groundwater
COC Reference: 2

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 01:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 1	1		ug/L	1	123-91-1	UB

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. LeBeau

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55122.01	10/27/23	925	MW-14-63_102723	GW	3		3						X	
.02	10/27/23	1045	MW-14-56_102723	GW	3		3						X	
.03	10/27/23	1225	MW-20-130_102723	GW	3		3						X	
.04	10/28/23	1120	MW-21-140_102823	GW	3		3						X	
.05	10/28/23	1215	MW-16-85_102823	GW	3		3						X	
.06	10/28/23	1345	MW-16-80_102823	GW	3		3						X	
.07	10/27/23	—	DUP-04_102723	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 10/30/23	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Gilcrease	DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S55122.01
Sample Tag: MW-14-63_102723
Collected Date/Time: 10/27/2023 09:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 4	~~1~~ 4		ug/L	1	123-91-1	UB

Lab Sample ID: S55122.02
Sample Tag: MW-14-56_102723
Collected Date/Time: 10/27/2023 10:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:31, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	17	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.03
Sample Tag: MW-20-130_102723
Collected Date/Time: 10/27/2023 12:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 02:52, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.04
Sample Tag: MW-21-140_102823
Collected Date/Time: 10/28/2023 11:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.05
Sample Tag: MW-16-85_102823
Collected Date/Time: 10/28/2023 12:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 03:33, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.06
Sample Tag: MW-16-80_102823
Collected Date/Time: 10/28/2023 13:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 03:55, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	22	1		ug/L	1	123-91-1	

Lab Sample ID: S55122.07
Sample Tag: DUP-04_102723
Collected Date/Time: 10/28/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:16, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	14	1		ug/L	1	123-91-1	

Plant 6

Merit Laboratories, Inc.

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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus LeWu

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55123.01	10/27/23	1035	MW-22-152_102723	GW	3		3							X
.02	10/27/23	1125	MW-22-154_102723	GW	3		3							X
.03	10/27/23	—	DUP-16_102723	GW	3		3							X
.04	10/27/23	—	Trip Blank	GW	1		1							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Aus LeWu / Arcadis ☒ Sampler		
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	M Quilcotto	DATE 10/30/23	TIME 0815
		DATE 10/30/23	TIME 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S55123.01
Sample Tag: MW-22-152_102723
Collected Date/Time: 10/27/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:24, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.01 (continued)
Sample Tag: MW-22-152_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:24, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.02
Sample Tag: MW-22-154_102723
Collected Date/Time: 10/27/2023 11:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:47, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.02 (continued)
Sample Tag: MW-22-154_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 20:47, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.03
Sample Tag: DUP-16_102723
Collected Date/Time: 10/27/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 21:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.03 (continued)
Sample Tag: DUP-16_102723

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 21:10, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55123.04
Sample Tag: Trip Blank
Collected Date/Time: 10/27/2023 00:01
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/06/23 12:30	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 16:04, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55123.04 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/03/23 16:04, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Plant 6

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Donald Dunn

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
55263.01	10/30/23	1030	MW-21-141-103023	GW	3		3						X	
.02	10/30/23	1205	MW-02-02(6)_103023	GW	3		3						X	
.03	10/30/23	1340	MW-03-05_103023	GW	3		3						X	
.04	10/30/23	1510	MW-03-06_103023	GW	3		3						X	
11/2/2023 BSB .05	~~10/30/23~~		~~MW-04-04R_103023~~	~~GW~~	~~3~~		~~3~~						~~X~~	
.05	10/31/23	1230	MW-04-05(6)_103123	GW	3		3							X
.06	10/30/23	—	Trip Blank	GW	1		1							X
.07	10/30/23	—	DUP-11_103023	GW	3		3						X	
.08	10/30/23	—	DUP-13_103023	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler	DATE: 11/2/23	TIME: 0800	RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit DropBox
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/2/23	TIME: 0800	RECEIVED BY: SIGNATURE/ORGANIZATION: Barbie Ball
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	DATE: 11/7/23 TIME: 0800
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	DATE: 11/7/23 TIME: 0800

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 5.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S55263.01
Sample Tag: MW-21-141_103023
Collected Date/Time: 10/30/2023 10:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:37, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.02
Sample Tag: MW-02-02(6)_103023
Collected Date/Time: 10/30/2023 12:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 04:58, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	23	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.03
Sample Tag: MW-03-05_103023
Collected Date/Time: 10/30/2023 13:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 05:19, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.04
Sample Tag: MW-03-06_103023
Collected Date/Time: 10/30/2023 15:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 05:40, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.05
Sample Tag: MW-04-05(6)_103123
Collected Date/Time: 10/31/2023 12:30
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/09/23 11:34	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 05:11, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55263.05 (continued)
Sample Tag: MW-04-05(6)_103123

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 05:11, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S55263.06
Sample Tag: Trip Blank
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/09/23 11:34	ACK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 02:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S55263.06 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/09/23 02:49, Analyst: NDK (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S55263.07
Sample Tag: DUP-11_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:01, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55263.08
Sample Tag: DUP-13_103023
Collected Date/Time: 10/30/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:21, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Plant 2

Merit Laboratories, Inc.

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C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Brit Cobean

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000
55264.01	10/30/23	945	PW-14-01_103023	GW	3		3						X				
02	10/30/23	1055	MW-20-129_103023	GW	3		3						X				
.03	10/30/23	1230	MW-19-122_103023	GW	3		3						X				
.04	10/30/23	1410	MW-19-124_103023	GW	3		3						X				
.05	10/30/23	1550	MW-21-142_103023	GW	3		3						X				
.06	10/30/23	1700	MW-20-126_103023	GW	3		3						X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis (Sampler)	DATE: 11/2/23	TIME: 0800	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/2/23	TIME: 0800	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Dropbox	DATE: 11/7/2023	TIME: 0800	
RECEIVED BY: SIGNATURE/ORGANIZATION: Barton Ball	DATE: 11/7/2023	TIME: 0800	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL: 5.8
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S55264.01
Sample Tag: PW-14-01_103023
Collected Date/Time: 10/30/2023 09:45
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 06:42, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 2	~~1~~ 2		ug/L	1	123-91-1	UB

Lab Sample ID: S55264.02
Sample Tag: MW-20-129_103023
Collected Date/Time: 10/30/2023 10:55
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 07:03, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	71	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S55264.03
Sample Tag: MW-19-122_103023
Collected Date/Time: 10/30/2023 12:30
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 07:25, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	< 4	~~1~~ 4		ug/L	1	123-91-1	UB

Lab Sample ID: S55264.04
Sample Tag: MW-19-124_103023
Collected Date/Time: 10/30/2023 14:10
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 15:58, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	143	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.05
Sample Tag: MW-21-142_103023
Collected Date/Time: 10/30/2023 15:50
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 08:07, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	70	1		ug/L	1	123-91-1	

Lab Sample ID: S55264.06
Sample Tag: MW-20-126_103023
Collected Date/Time: 10/30/2023 17:00
Matrix: Groundwater
COC Reference: 1

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/08/23 11:39	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/08/23 08:28, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	63	1		ug/L	1	123-91-1	

Plant 3

Merit Laboratories, Inc.

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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 947-777-5215 FAX NO.: P.O. NO.: US3460011467
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470B / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Bill Cobean

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS	Total Phosphorus SM4500-PE	TKN 4500 Norg/NH3	Nitrate E3000	Special Instructions
.01/.02/.03	11/1/23	1515	MW-12-21_110123	GW	9		9						X					MS/MSD
55364.04	11/1/23	1620	MW-13-22_110123	GW	3		3						X					
.05	11/2/23	940	MW-13-48_110223	GW	3		3						X					
.06	11/2/23	1055	MW-13-34_110223	GW	3		3						X					
.07	11/2/23	1200	AS-19A07_110223	GW	3		3						X					
.08	11/2/23	1310	AS-19A06_110223	GW	3		3						X					
.09	11/2/23	1405	TW-15-11_110223	GW	3		3						X					
.10	11/2/23	1550	PW-14-03R_110223	GW	3		3						X					

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler	DATE: 11/3/23	TIME: 0930	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/3/23	TIME: 0930	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 11/3/23	TIME: 0930	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE: 11/3/23	TIME: 0930	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Lab Sample ID: S55364.01
Sample Tag: MW-12-21_110123
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 16:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	118	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.02
Sample Tag: MW-12-21_110123 MS
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	152	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55364.03
Sample Tag: MW-12-21_110123 MSD
Collected Date/Time: 11/01/2023 15:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	147	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S55364.04
Sample Tag: MW-13-22_110123
Collected Date/Time: 11/01/2023 16:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 16:39, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	135	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.05
Sample Tag: MW-13-48_110223
Collected Date/Time: 11/02/2023 09:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 17:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.06
Sample Tag: MW-13-34_110223
Collected Date/Time: 11/02/2023 10:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 17:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	82	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.07
Sample Tag: AS-19-A07_110223
Collected Date/Time: 11/02/2023 12:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/10/23 14:49, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.08
Sample Tag: AS-19-A06_110223
Collected Date/Time: 11/02/2023 13:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 18:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.09
Sample Tag: TW-15-11_110223
Collected Date/Time: 11/02/2023 14:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 18:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	108	1		ug/L	1	123-91-1	

Lab Sample ID: S55364.10
Sample Tag: PW-14-03R_110223
Collected Date/Time: 11/02/2023 15:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/10/23 15:10, Analyst: NDK

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Plant 3

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder, Kaitlyn Hunt
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, STE 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 947-777-5215 | FAX NO.: | P.O. NO.: US3460011441
E-MAIL ADDRESS: kaitlyn.hunt@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: tiffany.linder@arcadis.com

PROJECT NO./NAME: 30171056.0470A / RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane - 8260 SIMS	VOC - 8260 SIMS
553650.01	11/1/23	1605	MW-13-27_110123	GW	3		3						X	
.02	11/2/23	1035	MW-13-23_110223	GW	3		3						X	
03/.04/.05	11/2/23	1150	MW-13-25_110223	GW	9		9						X	
.06	11/2/23	1355	MW-13-46_110223	GW	3		3						X	
.07	11/2/23	—	DUP-08_110223	GW	3		3						X	

Special Instructions: MS/MSD

RELINQUISHED BY: SIGNATURE/ORGANIZATION (Sampler)	Arcadis	DATE 11/3/23	TIME 0930
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 11/3/23	TIME 0930
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Prof. Box	DATE 11/3/23	TIME 0930
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 11/3/23	TIME 0930
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 6.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Lab Sample ID: S55365.01
Sample Tag: MW-13-27_110123
Collected Date/Time: 11/01/2023 16:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	6	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.02
Sample Tag: MW-13-23_110123
Collected Date/Time: 11/01/2023 10:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.03
Sample Tag: MW-13-25_110223
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 19:49, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.04
Sample Tag: MW-13-25_110223 MS
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	40	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S55365.05
Sample Tag: MW-13-25_110223 MSD
Collected Date/Time: 11/02/2023 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 21:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	42	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S55365.06
Sample Tag: MW-13-46_110223
Collected Date/Time: 11/02/2023 13:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S55365.07
Sample Tag: Dup-08_110223
Collected Date/Time: 11/02/2023 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	6.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/10/23 11:55	ACK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/09/23 20:31, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Appendix B-2

Soil Vapor Laboratory Analytical Reports

Fibertec
environmental
services

Monday, March 13, 2023

Fibertec Project Number:	A13506 Amended
Project Identification:	RACER Lansing (30171056.00102) /30171056.00102
Submittal Date:	02/14/2023

Ms. Kaitlyn Hunt
Arcadis U.S., Inc. - Novi
28550 Cabot Drive
Suite 500
Novi, MI 48377

Dear Ms. Hunt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

This report has been amended to correct the project number and sample descriptors per client request. This replaces the report sent on Feburaury 19th, 2023.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Bailey Welch

By Bailey Welch at 4:13 PM, Mar 13, 2023

For Daryl P. Strandbergh
Laboratory Director

Enclosures

Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A13506
Laboratory Sample Number: A13506-001

Order: A13506
Date: 03/13/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01_021423**	Chain of Custody:	**210534**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**02/14/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**11:16**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A13506-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01_021423**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
2. Benzene	U		µg/m3	19	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
3. Benzyl Chloride	U		µg/m3	6.2	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
4. Bromodichloromethane	U		µg/m3	8.0	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
5. Bromoform	U		µg/m3	62	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
6. Bromomethane	U		µg/m3	23	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
8. 2-Butanone	U		µg/m3	35	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
11. Chlorobenzene	U		µg/m3	28	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
12. Chloroethane	U		µg/m3	16	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
13. Chloroform	U		µg/m3	5.9	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
14. Chloromethane	U		µg/m3	12	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
15. Cyclohexane	U		µg/m3	41	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
16. Dibromochloromethane	U		µg/m3	4.1	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
29. 1,4-Dioxane	U		µg/m3	22	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
31. Ethylbenzene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
33. n-Heptane	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
35. n-Hexane	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 37. Isopropanol	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY

Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A13506
Laboratory Sample Number: A13506-001

Order: A13506
Date: 03/13/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01_021423**	Chain of Custody:	**210534**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**02/14/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**11:16**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A13506-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01_021423**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
39. Methylene Chloride	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 40. 2-Methylnaphthalene	U		µg/m3	140	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
41. MTBE	U		µg/m3	22	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 42. Naphthalene	U		µg/m3	19	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
43. Styrene	U		µg/m3	51	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
44. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
45. Tetrachloroethene	U		µg/m3	41	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 46. Tetrahydrofuran	U		µg/m3	3.5	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
47. Toluene	U		µg/m3	23	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
48. 1,2,4-Trichlorobenzene	U		µg/m3	89	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
49. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
50. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
51. Trichloroethene	U		µg/m3	1.6	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
52. Trichlorofluoromethane	U		µg/m3	34	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 53. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
54. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
55. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
56. Vinyl Acetate	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
57. Vinyl Chloride	U		µg/m3	15	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
58. m&p-Xylene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
59. o-Xylene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY
‡ 60. Xylenes	U		µg/m3	100	4.0	02/15/23	VQ23B15A	02/16/23 00:40	VQ23B15A	CY

Surrogate Summary			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**94**	%	80-120	VQ	VQ23B15A	2/16/2023 00:40	1	VQ400

Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A13506
Laboratory Sample Number: A13506-002

Order: A13506
Date: 03/13/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01_021423**	Chain of Custody:	**210534**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**02/14/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A13506-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01_021423**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
2. Benzene	U		µg/m3	19	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
3. Benzyl Chloride	U		µg/m3	6.2	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
4. Bromodichloromethane	U		µg/m3	8.0	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
5. Bromoform	U		µg/m3	62	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
6. Bromomethane	U		µg/m3	23	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
8. 2-Butanone	U		µg/m3	35	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
11. Chlorobenzene	U		µg/m3	28	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
12. Chloroethane	U		µg/m3	16	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
13. Chloroform	U		µg/m3	5.9	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
14. Chloromethane	U		µg/m3	12	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
15. Cyclohexane	U		µg/m3	41	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
16. Dibromochloromethane	U		µg/m3	4.1	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
29. 1,4-Dioxane	U		µg/m3	22	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
31. Ethylbenzene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
33. n-Heptane	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
35. n-Hexane	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 37. Isopropanol	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY

Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A13506
Laboratory Sample Number: A13506-002

Order: A13506
Date: 03/13/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01_021423**	Chain of Custody:	**210534**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**02/14/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A13506-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01_021423**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
39. Methylene Chloride	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 40. 2-Methylnaphthalene	U		µg/m3	140	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
41. MTBE	U		µg/m3	22	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 42. Naphthalene	U		µg/m3	19	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
43. Styrene	U		µg/m3	51	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
44. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
45. Tetrachloroethene	U		µg/m3	41	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 46. Tetrahydrofuran	U		µg/m3	3.5	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
47. Toluene	U		µg/m3	23	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
48. 1,2,4-Trichlorobenzene	U		µg/m3	89	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
49. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
50. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
51. Trichloroethene	U		µg/m3	1.6	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
52. Trichlorofluoromethane	U		µg/m3	34	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 53. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
54. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
55. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
56. Vinyl Acetate	U		µg/m3	42	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
57. Vinyl Chloride	U		µg/m3	15	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
58. m&p-Xylene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
59. o-Xylene	U		µg/m3	52	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY
‡ 60. Xylenes	U		µg/m3	100	4.0	02/15/23	VQ23B15A	02/16/23 01:33	VQ23B15A	CY

Surrogate Summary

			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**92**	%	80-120	VQ	VQ23B15A	2/16/2023 01:33	1	VQ400

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QC limits
D: The sample or extract was analyzed at a DF greater than 1.

Exception Summary:

Analysis Locations:

All analyses performed in Holt.

NELAP ACCREDITED TNI LABORATORY

Accreditation Number(s):

T104704518-23-15 (TX)

VQ23B15A: Method Blank (MB)

EPA TO-15

Run Time: VQ23B15A.MB 02/15/2023 14:55 [VQ23B15A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Acetone	U		57
Benzene	U		19
Benzyl Chloride	U		6.2
Bromodichloromethane	U		8.0
Bromoform	U		62
Bromomethane	U		23
1,3-Butadiene	U		2.7
2-Butanone	U		35
Carbon Disulfide	U		37
Carbon Tetrachloride	U		7.5
Chlorobenzene	U		28
Chloroethane	U		16
Chloroform	U		5.9
Chloromethane	U		12
Cyclohexane	U		41
Dibromochloromethane	U		4.1
1,2-Dichlorobenzene	U		36
1,3-Dichlorobenzene	U		36
1,4-Dichlorobenzene	U		36
Dichlorodifluoromethane	U		30
1,1-Dichloroethane	U		24
1,2-Dichloroethane	U		4.9
1,1-Dichloroethene	U		24
cis-1,2-Dichloroethene	U		24
trans-1,2-Dichloroethene	U		24
1,2-Dichloropropane	U		28
cis-1,3-Dichloropropene	U		27
trans-1,3-Dichloropropene	U		27
1,4-Dioxane	U		22
Ethyl Acetate	U		43
Ethylbenzene	U		52
Ethylene Dibromide	U		0.92
n-Heptane	U		49

VQ23B15A: Method Blank (MB)

EPA TO-15

Run Time: VQ23B15A.MB 02/15/2023 14:55 [VQ23B15A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Hexachlorobutadiene	U		5.1
n-Hexane	U		42
2-Hexanone	U		49
Isopropanol	U		29
4-Methyl-2-pentanone	U		49
Methylene Chloride	U		42
2-Methylnaphthalene	U		140
MTBE	U		22
Naphthalene	U		19
Styrene	U		51
1,1,2,2-Tetrachloroethane	U		3.3
Tetrachloroethene	U		41
Tetrahydrofuran	U		3.5
Toluene	U		23
1,2,4-Trichlorobenzene	U		89
1,1,1-Trichloroethane	U		33
1,1,2-Trichloroethane	U		6.5
Trichloroethene	U		1.6
Trichlorofluoromethane	U		34
1,1,2-Trichlorotrifluoroethane	U		46
1,2,4-Trimethylbenzene	U		29
1,3,5-Trimethylbenzene	U		29
Vinyl Acetate	U		42
Vinyl Chloride	U		15
m&p-Xylene	U		52
o-Xylene	U		52
4-Bromofluorobenzene(S)	*96*		*80-120*

VQ23B15A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23B15A.LCS: 02/15/2023 12:05 [VQ23B15A] VQ23B15A.LCSD: 02/15/2023 13:02 [VQ23B15A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Acetone	30.0	28.6	95	70-130		30.0	28.2	94		1	20	
Benzene	41.9	40.4	96	70-130		41.9	39.7	95		1	20	
Benzyl Chloride	66.0	55.1	83	70-150		66.0	56.5	86		4	20	
Bromodichloromethane	87.1	86.2	99	70-130		87.1	86.6	99		0	20	
Bromoform	134	126	94	70-138		134	130	97		3	20	
Bromomethane	50.5	49.5	98	70-133		50.5	50.3	100		2	20	
1,3-Butadiene	28.7	24.7	86	70-134		28.7	25.1	87		1	20	
2-Butanone	38.3	39.5	103	70-130		38.3	38.2	100		3	20	
Carbon Disulfide	41.2	34.7	84	70-130		41.2	34.3	83		1	20	
Carbon Tetrachloride	83.3	81.4	98	70-131		83.3	82.8	99		1	20	
Chlorobenzene	60.4	56.3	93	70-130		60.4	57.6	95		2	20	
Chloroethane	34.3	33.2	97	70-130		34.3	33.0	96		1	20	
Chloroform	63.4	65.2	103	70-130		63.4	65.1	103		0	20	
Chloromethane	27.1	23.9	88	70-130		27.1	24.0	89		1	20	
Cyclohexane	44.3	47.0	106	70-130		44.3	45.9	104		2	20	
Dibromochloromethane	110	109	99	70-135		110	111	101		2	20	
1,2-Dichlorobenzene	78.1	67.6	87	70-130		78.1	70.4	90		3	20	
1,3-Dichlorobenzene	77.4	68.2	88	70-131		77.4	70.8	92		4	20	
1,4-Dichlorobenzene	78.1	66.4	85	70-134		78.1	68.6	88		3	20	
Dichlorodifluoromethane	64.9	64.0	99	70-132		64.9	66.2	102		3	20	
1,1-Dichloroethane	52.6	52.6	100	70-130		52.6	51.6	98		2	20	
1,2-Dichloroethane	53.1	53.4	101	70-130		53.1	53.2	100		1	20	
1,1-Dichloroethene	52.0	52.7	101	70-133		52.0	52.2	100		1	20	
cis-1,2-Dichloroethene	52.0	53.5	103	70-130		52.0	52.8	101		2	20	
trans-1,2-Dichloroethene	51.0	51.6	101	70-130		51.0	50.7	99		2	20	
1,2-Dichloropropane	60.6	62.2	103	70-130		60.6	60.8	100		3	20	
cis-1,3-Dichloropropene	59.0	60.8	103	70-131		59.0	60.3	102		1	20	
trans-1,3-Dichloropropene	59.0	59.5	101	70-134		59.0	60.3	102		1	20	
1,4-Dioxane	46.8	44.1	94	70-130		46.8	44.5	95		1	20	
Ethyl Acetate	46.4	45.9	99	70-130		46.4	44.5	96		3	20	
Ethylbenzene	57.0	54.7	96	70-130		57.0	55.4	97		1	20	
Ethylene Dibromide	98.9	94.8	96	70-130		98.9	95.9	97		1	20	
n-Heptane	52.7	55.7	106	70-132		52.7	54.7	104		2	20	

VQ23B15A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23B15A.LCS: 02/15/2023 12:05 [VQ23B15A] VQ23B15A.LCSD: 02/15/2023 13:02 [VQ23B15A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Hexachlorobutadiene	144	128	89	70-134		144	135	94		5	20	
n-Hexane	45.4	42.2	93	70-130		45.4	40.9	90		3	20	
2-Hexanone	52.7	55.5	105	70-139		52.7	55.1	105		0	20	
Isopropanol	32.9	37.0	113	54-144		32.9	36.0	109		4	20	
4-Methyl-2-pentanone	52.7	55.6	106	70-130		52.7	54.5	103		3	20	
Methylene Chloride	45.1	43.5	96	70-132		45.1	42.5	94		2	20	
2-Methylnaphthalene	83.6	76.9	92	70-146		83.6	78.8	94		2	20	
MTBE	46.8	48.5	103	70-130		46.8	48.0	103		0	20	
Naphthalene	74.7	73.2	98	70-148		74.7	76.1	102		4	20	
Styrene	55.4	53.5	97	70-130		55.4	54.8	99		2	20	
1,1,2,2-Tetrachloroethane	90.1	81.2	90	70-130		90.1	81.7	91		1	20	
Tetrachloroethene	88.1	80.4	91	70-130		88.1	82.4	93		2	20	
Tetrahydrofuran	38.0	41.6	110	70-138		38.0	39.1	103		7	20	
Toluene	49.4	48.1	97	70-130		49.4	49.0	99		2	20	
1,2,4-Trichlorobenzene	102	92.6	91	70-140		102	97.0	95		4	20	
1,1,1-Trichloroethane	70.9	70.9	100	70-130		70.9	72.1	102		2	20	
1,1,2-Trichloroethane	70.9	67.0	94	70-130		70.9	66.4	94		0	20	
Trichloroethene	70.5	69.5	99	70-130		70.5	69.4	98		1	20	
Trichlorofluoromethane	72.3	70.7	98	70-132		72.3	71.7	99		1	20	
1,1,2-Trichlorotrifluoroethane	101	99.0	98	70-130		101	99.0	99		1	20	
1,2,4-Trimethylbenzene	64.5	60.0	93	70-132		64.5	61.8	96		3	20	
1,3,5-Trimethylbenzene	64.5	60.4	94	70-131		64.5	62.2	96		2	20	
Vinyl Acetate	48.0	49.9	104	70-131		48.0	50.0	104		0	20	
Vinyl Chloride	33.2	31.6	95	70-131		33.2	32.1	97		2	20	
m&p-Xylene	114	109	95	70-130		114	111	97		2	20	
o-Xylene	56.4	53.7	95	70-130		56.4	54.7	97		2	20	
4-Bromofluorobenzene(S)			*99*	*80-120*				*100*				

Definitions/ Qualifiers:

U: The analyte was not detected at or above the Reporting Limit (RL).
***:** Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

By Sue Ricketts at 10:48 AM, Feb 19, 2023

Fibertec environmental services

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Geoprobe
11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
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Chain of Custody # 210534
PAGE 1 of 1

Client Name: Arcadis
Contact Person: Kaitlin Hunt
Project Name/ Number: RACER Lansing / 30112892.00102
Email distribution list: Kaitlin.Hunt@arcadis.com; Tiffany.Linder@arcadis.com
Quote#
Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PARAMETERS: TO-15	HOLD SAMPLE
2/14/23	1116	1	SVMP-20-01_021423	A	1	X	
2/14/23	———	2	DUP-01_021423	A	1	X	

Matrix Code: S Soil; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Deliverables: Level 2; Level 3; Level 4; EDD

Remarks:

Received By Lab
FEB 14 2023
Initials: BP

Comments:

Sampled/Relinquished By: Austin Westhuis / Arcadis — Date/ Time: 2/14/23 12:13 — Received By:
Relinquished By: — Date/ Time: — Received By:
Relinquished By: — Date/ Time: — Received By Laboratory:

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days
X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY
Fibertec project number: A13506
Temperature upon receipt at Lab: Room Temp

Please see back for terms and conditions

Fibertec
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services

Tuesday, May 9, 2023

Fibertec Project Number:	A14908
Project Identification:	RACER lansing (30171056) /30171056
Submittal Date:	05/01/2023

Ms. Kaitlyn Hunt
Arcadis U.S., Inc. - Novi
28550 Cabot Drive
Suite 500
Novi, MI 48377

Dear Ms. Hunt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

By Sue Ricketts at 2:28 PM, May 09, 2023

For Daryl P. Strandbergh
Laboratory Director

Enclosures

Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A14908
Laboratory Sample Number: A14908-001

Order: A14908
Date: 05/09/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP_20_01_050123**	Chain of Custody:	**214381**
Client Project Name:	**RACER lansing (30171056)**	Sample No:	**1**	Collect Date:	**05/01/23**
Client Project No:	**30171056**	Sample Matrix:	**Air**	Collect Time:	**11:27**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A14908-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP_20_01_050123**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
2. Benzene	U		µg/m3	19	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
3. Benzyl Chloride	U		µg/m3	6.2	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
4. Bromodichloromethane	U		µg/m3	8.0	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
5. Bromoform	U		µg/m3	62	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
6. Bromomethane	U		µg/m3	23	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
8. 2-Butanone	U		µg/m3	35	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
11. Chlorobenzene	U		µg/m3	28	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
12. Chloroethane	U		µg/m3	16	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
13. Chloroform	U		µg/m3	5.9	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
14. Chloromethane	U		µg/m3	12	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
15. Cyclohexane	U		µg/m3	41	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
16. Dibromochloromethane	U		µg/m3	4.1	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
29. 1,4-Dioxane	U		µg/m3	22	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
31. Ethylbenzene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
33. n-Heptane	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
35. n-Hexane	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 37. Isopropanol	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA

1914 Holloway Drive *Holt, MI 48842* *T: (517) 699-0345* *F: (517) 699-0388*
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8660 S. Mackinaw Trail *Cadillac, MI 49601* *T: (231) 775-8368* *F: (231) 775-8584*

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Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A14908
Laboratory Sample Number: A14908-001

Order: A14908
Date: 05/09/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP_20_01_050123**	Chain of Custody:	**214381**
Client Project Name:	**RACER lansing (30171056)**	Sample No:	**1**	Collect Date:	**05/01/23**
Client Project No:	**30171056**	Sample Matrix:	**Air**	Collect Time:	**11:27**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A14908-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP_20_01_050123**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
39. Methylene Chloride	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 40. 2-Methylnaphthalene	U		µg/m3	140	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
41. MTBE	U		µg/m3	22	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 42. Naphthalene	U		µg/m3	19	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
43. Styrene	U		µg/m3	51	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
44. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
45. Tetrachloroethene	U		µg/m3	41	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 46. Tetrahydrofuran	**6.3**		µg/m3	3.5	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
47. Toluene	U		µg/m3	23	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
48. 1,2,4-Trichlorobenzene	U		µg/m3	89	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
49. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
50. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
51. Trichloroethene	U		µg/m3	1.6	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
52. Trichlorofluoromethane	U		µg/m3	34	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 53. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
54. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
55. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
56. Vinyl Acetate	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
57. Vinyl Chloride	U		µg/m3	15	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
58. m&p-Xylene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
59. o-Xylene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA
‡ 60. Xylenes	U		µg/m3	100	4.0	05/02/23	VN23E02A	05/02/23 23:59	VN23E02A	CMA

Surrogate Summary			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**93**	%	80-120	VN	VN23E02A	5/2/2023 23:59	1	VN400

1914 Holloway Drive *Holt, MI 48842* *T: (517) 699-0345* *F: (517) 699-0388*
11766 E. Grand River *Brighton, MI 48116* *T: (810) 220-3300* *F: (810) 220-3311*
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Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A14908
Laboratory Sample Number: A14908-002

Order: A14908
Date: 05/09/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP_01_050123**	Chain of Custody:	**214381**
Client Project Name:	**RACER lansing (30171056)**	Sample No:	**2**	Collect Date:	**05/01/23**
Client Project No:	**30171056**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A14908-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP_01_050123**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
2. Benzene	U		µg/m3	19	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
3. Benzyl Chloride	U		µg/m3	6.2	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
4. Bromodichloromethane	U		µg/m3	8.0	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
5. Bromoform	U		µg/m3	62	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
6. Bromomethane	U		µg/m3	23	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
8. 2-Butanone	U		µg/m3	35	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
11. Chlorobenzene	U		µg/m3	28	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
12. Chloroethane	U		µg/m3	16	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
13. Chloroform	U		µg/m3	5.9	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
14. Chloromethane	U		µg/m3	12	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
15. Cyclohexane	U		µg/m3	41	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
16. Dibromochloromethane	U		µg/m3	4.1	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
29. 1,4-Dioxane	U		µg/m3	22	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
31. Ethylbenzene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
33. n-Heptane	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
35. n-Hexane	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 37. Isopropanol	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA

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Fibertec environmental services

Analytical Laboratory Report
Laboratory Project Number: A14908
Laboratory Sample Number: A14908-002

Order: A14908
Date: 05/09/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP_01_050123**	Chain of Custody:	**214381**
Client Project Name:	**RACER lansing (30171056)**	Sample No:	**2**	Collect Date:	**05/01/23**
Client Project No:	**30171056**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A14908-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP_01_050123**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
39. Methylene Chloride	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 40. 2-Methylnaphthalene	U		µg/m3	140	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
41. MTBE	U		µg/m3	22	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 42. Naphthalene	U		µg/m3	19	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
43. Styrene	U		µg/m3	51	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
44. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
45. Tetrachloroethene	U		µg/m3	41	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 46. Tetrahydrofuran	**5.3**		µg/m3	3.5	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
47. Toluene	U		µg/m3	23	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
48. 1,2,4-Trichlorobenzene	U		µg/m3	89	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
49. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
50. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
51. Trichloroethene	U		µg/m3	1.6	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
52. Trichlorofluoromethane	U		µg/m3	34	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 53. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
54. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
55. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
56. Vinyl Acetate	U		µg/m3	42	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
57. Vinyl Chloride	U		µg/m3	15	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
58. m&p-Xylene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
59. o-Xylene	U		µg/m3	52	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA
‡ 60. Xylenes	U		µg/m3	100	4.0	05/02/23	VN23E02A	05/03/23 00:52	VN23E02A	CMA

Surrogate Summary			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**92**	%	80-120	VN	VN23E02A	5/3/2023 00:52	1	VN400

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lab@fibertec.us

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QC limits
D: The sample or extract was analyzed at a DF greater than 1.

Exception Summary:

Analysis Locations:

All analyses performed in Holt.



Accreditation Number(s):

T104704518-23-15 (TX)

VN23E02A: Method Blank (MB)

EPA TO-15

Run Time: VN23E02A.MB 05/02/2023 12:19 [VN23E02A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Acetone	U		57
Benzene	U		19
Benzyl Chloride	U		6.2
Bromodichloromethane	U		8.0
Bromoform	U		62
Bromomethane	U		23
1,3-Butadiene	U		2.7
2-Butanone	U		35
Carbon Disulfide	U		37
Carbon Tetrachloride	U		7.5
Chlorobenzene	U		28
Chloroethane	U		16
Chloroform	U		5.9
Chloromethane	U		12
Cyclohexane	U		41
Dibromochloromethane	U		4.1
1,2-Dichlorobenzene	U		36
1,3-Dichlorobenzene	U		36
1,4-Dichlorobenzene	U		36
Dichlorodifluoromethane	U		30
1,1-Dichloroethane	U		24
1,2-Dichloroethane	U		4.9
1,1-Dichloroethene	U		24
cis-1,2-Dichloroethene	U		24
trans-1,2-Dichloroethene	U		24
1,2-Dichloropropane	U		28
cis-1,3-Dichloropropene	U		27
trans-1,3-Dichloropropene	U		27
1,4-Dioxane	U		22
Ethyl Acetate	U		43
Ethylbenzene	U		52
Ethylene Dibromide	U		0.92
n-Heptane	U		49

VN23E02A: Method Blank (MB)

EPA TO-15

Run Time: VN23E02A.MB 05/02/2023 12:19 [VN23E02A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Hexachlorobutadiene	U		5.1
n-Hexane	U		42
2-Hexanone	U		49
Isopropanol	U		29
4-Methyl-2-pentanone	U		49
Methylene Chloride	U		42
2-Methylnaphthalene	U		140
MTBE	U		22
Naphthalene	U		19
Styrene	U		51
1,1,2,2-Tetrachloroethane	U		3.3
Tetrachloroethene	U		41
Tetrahydrofuran	U		3.5
Toluene	U		23
1,2,4-Trichlorobenzene	U		89
1,1,1-Trichloroethane	U		33
1,1,2-Trichloroethane	U		6.5
Trichloroethene	U		1.6
Trichlorofluoromethane	U		34
1,1,2-Trichlorotrifluoroethane	U		46
1,2,4-Trimethylbenzene	U		29
1,3,5-Trimethylbenzene	U		29
Vinyl Acetate	U		42
Vinyl Chloride	U		15
m&p-Xylene	U		52
o-Xylene	U		52
4-Bromofluorobenzene(S)	*91*		*80-120*

VN23E02A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) — EPA TO-15

Run Time: VN23E02A.LCS: 05/02/2023 09:31 [VN23E02A] VN23E02A.LCSD: 05/02/2023 10:26 [VN23E02A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Acetone	30.0	33.0	110	70-130		30.0	32.1	107		3	20	
Benzene	41.9	43.4	104	70-130		41.9	43.8	105		1	20	
Benzyl Chloride	66.0	80.7	122	70-150		66.0	81.5	124		2	20	
Bromodichloromethane	87.1	96.0	110	70-130		87.1	97.0	111		1	20	
Bromoform	134	153	114	70-138		134	156	116		2	20	
Bromomethane	50.5	58.6	116	70-133		50.5	57.7	114		2	20	
1,3-Butadiene	28.7	32.0	111	70-134		28.7	31.8	111		0	20	
2-Butanone	38.3	39.9	104	70-130		38.3	39.4	103		1	20	
Carbon Disulfide	41.2	38.1	92	70-130		41.2	37.5	91		1	20	
Carbon Tetrachloride	83.3	86.0	103	70-131		83.3	86.7	104		1	20	
Chlorobenzene	60.4	67.7	112	70-130		60.4	68.5	113		1	20	
Chloroethane	34.3	40.9	119	70-130		34.3	40.6	118		1	20	
Chloroform	63.4	72.0	113	70-130		63.4	71.5	113		0	20	
Chloromethane	27.1	31.4	116	70-130		27.1	30.9	114		2	20	
Cyclohexane	44.3	49.0	111	70-130		44.3	49.4	112		1	20	
Dibromochloromethane	110	121	110	70-135		110	122	111		1	20	
1,2-Dichlorobenzene	78.1	88.2	113	70-130		78.1	89.4	114		1	20	
1,3-Dichlorobenzene	77.4	92.1	119	70-131		77.4	93.5	121		2	20	
1,4-Dichlorobenzene	78.1	89.3	114	70-134		78.1	89.6	115		1	20	
Dichlorodifluoromethane	64.9	72.1	111	70-132		64.9	70.9	109		2	20	
1,1-Dichloroethane	52.6	57.5	109	70-130		52.6	56.5	107		2	20	
1,2-Dichloroethane	53.1	59.9	113	70-130		53.1	59.2	111		2	20	
1,1-Dichloroethene	52.0	57.1	110	70-133		52.0	56.6	109		1	20	
cis-1,2-Dichloroethene	52.0	58.6	113	70-130		52.0	57.8	111		2	20	
trans-1,2-Dichloroethene	51.0	56.1	110	70-130		51.0	55.9	110		0	20	
1,2-Dichloropropane	60.6	66.2	109	70-130		60.6	66.7	110		1	20	
cis-1,3-Dichloropropene	59.0	68.9	117	70-131		59.0	69.2	117		0	20	
trans-1,3-Dichloropropene	59.0	70.8	120	70-134		59.0	70.8	120		0	20	
1,4-Dioxane	46.8	49.6	106	70-130		46.8	49.8	106		0	20	
Ethyl Acetate	46.4	49.5	107	70-130		46.4	48.7	105		2	20	
Ethylbenzene	57.0	65.1	114	70-130		57.0	65.8	116		2	20	
Ethylene Dibromide	98.9	110	111	70-130		98.9	112	113		2	20	
n-Heptane	52.7	60.0	114	70-132		52.7	60.3	114		0	20	

VN23E02A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VN23E02A.LCS: 05/02/2023 09:31 [VN23E02A] VN23E02A.LCSD: 05/02/2023 10:26 [VN23E02A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Hexachlorobutadiene	144	121	84	70-134		144	122	85		1	20	
n-Hexane	45.4	44.0	97	70-130		45.4	43.1	95		2	20	
2-Hexanone	52.7	59.0	112	70-139		52.7	59.3	112		0	20	
Isopropanol	32.9	36.4	111	54-144		32.9	35.9	109		2	20	
4-Methyl-2-pentanone	52.7	59.0	112	70-130		52.7	59.7	113		1	20	
Methylene Chloride	45.1	44.5	99	70-132		45.1	44.0	98		1	20	
2-Methylnaphthalene	83.6	62.0	74	70-146		83.6	61.8	74		0	20	
MTBE	46.8	51.5	110	70-130		46.8	51.2	109		1	20	
Naphthalene	74.7	78.3	105	70-148		74.7	78.5	105		0	20	
Styrene	55.4	63.8	115	70-130		55.4	64.8	117		2	20	
1,1,2,2-Tetrachloroethane	90.1	104	115	70-130		90.1	105	117		2	20	
Tetrachloroethene	88.1	96.3	109	70-130		88.1	96.2	109		0	20	
Tetrahydrofuran	38.0	41.9	110	70-138		38.0	41.3	109		1	20	
Toluene	49.4	52.9	107	70-130		49.4	53.6	108		1	20	
1,2,4-Trichlorobenzene	102	112	110	70-140		102	115	112		2	20	
1,1,1-Trichloroethane	70.9	74.9	106	70-130		70.9	75.3	106		0	20	
1,1,2-Trichloroethane	70.9	75.2	106	70-130		70.9	76.0	107		1	20	
Trichloroethene	70.5	80.4	114	70-130		70.5	81.7	116		2	20	
Trichlorofluoromethane	72.3	75.2	104	70-132		72.3	74.1	103		1	20	
1,1,2-Trichlorotrifluoroethane	101	107	107	70-130		101	106	105		2	20	
1,2,4-Trimethylbenzene	64.5	75.1	116	70-132		64.5	76.2	118		2	20	
1,3,5-Trimethylbenzene	64.5	74.4	115	70-131		64.5	75.5	117		2	20	
Vinyl Acetate	48.0	52.7	110	70-131		48.0	51.8	108		2	20	
Vinyl Chloride	33.2	39.1	118	70-131		33.2	38.4	116		2	20	
m&p-Xylene	114	129	113	70-130		114	131	115		2	20	
o-Xylene	56.4	65.4	116	70-130		56.4	66.5	118		2	20	
4-Bromofluorobenzene(S)			*98*	*80-120*				*98*				

Definitions/ Qualifiers:

U: The analyte was not detected at or above the Reporting Limit (RL).
***:** Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:



By Sue Ricketts at 2:33 PM, May 09, 2023

Fibertec environmental services

Analytical Laboratory

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Fax: 231 775 8584

Geoprobe

11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 214381

PAGE 1 of 1

Client Name: Arcadis

Contact Person: Kaitlyn Hunt

Project Name/ Number: RACER Lansing / 30171056

Email distribution list: Kaitlyn.Hunt@arcadis.com, Tiffany.Linder@arcadis.com

Quote#

Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PARAMETERS: TO-15	HOLD SAMPLE
5/1/23	1127	1	SVMP-20-01_050123	A	1	X	
5/1/23	———	2	DUP-01_050123	A	1	X	

Matrix Code

S	Soil	GW	Ground Water
A	Air	SW	Surface Water
O	Oil	WW	Waste Water
P	Wipe	X	Other: Specify

Deliverables: Level 2, Level 3, Level 4, EDD

Remarks:

Received By Lab
MAY 01 2023
Initials: JS

Comments:

Sampled/Relinquished By: Austin Westhuis / Arcadis — Date/ Time 5/1/23 1332 — Received By:

Relinquished By: — Date/ Time — Received By:

Relinquished By: — Date/ Time — Received By Laboratory:

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days

X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY

Fibertec project number: A14908

Temperature upon receipt at Lab: Room Temp

Please see back for terms and conditions

Fibertec environmental services
A METIRI GROUP COMPANY

Tuesday, September 5, 2023

Fibertec Project Number:	A16920
Project Identification:	RACER Lansing (30171056.00102) /30171056.00102
Submittal Date:	08/29/2023

Ms. Kaitlyn Hunt
Arcadis U.S., Inc. - Novi
28550 Cabot Drive
Suite 500
Novi, MI 48377

Dear Ms. Hunt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

By Sue Ricketts at 1:14 PM, Sep 05, 2023

For Heather L. Smith
Director of Laboratory Operations

Enclosures

Analytical Laboratory Report
Laboratory Project Number: A16920
Laboratory Sample Number: A16920-001

Order: A16920
Date: 09/05/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01(082923)**	Chain of Custody:	**220154**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**08/29/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**09:30**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A16920-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01(082923)**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
2. Benzene	U		µg/m3	19	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
3. Benzyl Chloride	U		µg/m3	6.2	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
4. Bromodichloromethane	U		µg/m3	8.0	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
5. Bromoform	U		µg/m3	62	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
6. Bromomethane	U		µg/m3	23	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
8. 2-Butanone	U		µg/m3	35	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
10. Carbon Tetrachloride	U	V+	µg/m3	7.5	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
11. Chlorobenzene	U		µg/m3	28	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
12. Chloroethane	U		µg/m3	16	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
13. Chloroform	U		µg/m3	5.9	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
14. Chloromethane	U		µg/m3	12	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
15. Cyclohexane	U		µg/m3	41	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
16. Dibromochloromethane	U		µg/m3	4.1	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
20. Dichlorodifluoromethane	U	V+	µg/m3	30	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
22. 1,2-Dichloroethane	U	V+	µg/m3	4.9	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
29. 1,4-Dioxane	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
31. Ethylbenzene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
33. n-Heptane	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
35. n-Hexane	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM

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Analytical Laboratory Report
Laboratory Project Number: A16920
Laboratory Sample Number: A16920-001

Order: A16920
Date: 09/05/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01(082923)**	Chain of Custody:	**220154**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**08/29/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**09:30**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A16920-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01(082923)**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 37. Isopropanol	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
39. Methylene Chloride	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
40. MTBE	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 41. Naphthalene	U		µg/m3	19	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
42. Styrene	U		µg/m3	51	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
43. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
44. Tetrachloroethene	U		µg/m3	41	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 45. Tetrahydrofuran	U		µg/m3	3.5	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
46. Toluene	U		µg/m3	23	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
47. 1,2,4-Trichlorobenzene	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
48. 1,1,1-Trichloroethane	U	V+	µg/m3	33	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
49. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
50. Trichloroethene	**5.7**		µg/m3	1.6	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
51. Trichlorofluoromethane	U	V+	µg/m3	34	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 52. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
53. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
54. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
55. Vinyl Acetate	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
56. Vinyl Chloride	U		µg/m3	15	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
57. m&p-Xylene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
58. o-Xylene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM
‡ 59. Xylenes	U		µg/m3	100	4.0	08/31/23	VQ23H31B	08/31/23 22:28	VQ23H31B	CM

Surrogate Summary

			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**103**	%	80-120	VQ	VQ23H31B	8/31/2023 22:28	1	VQ400

Analytical Laboratory Report
Laboratory Project Number: A16920
Laboratory Sample Number: A16920-002

Order: A16920
Date: 09/05/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01 (082923)**	Chain of Custody:	**220154**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**08/29/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A16920-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01 (082923)**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
2. Benzene	U		µg/m3	19	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
3. Benzyl Chloride	U		µg/m3	6.2	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
4. Bromodichloromethane	U		µg/m3	8.0	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
5. Bromoform	U		µg/m3	62	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
6. Bromomethane	U		µg/m3	23	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
8. 2-Butanone	U		µg/m3	35	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
10. Carbon Tetrachloride	U	V+	µg/m3	7.5	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
11. Chlorobenzene	U		µg/m3	28	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
12. Chloroethane	U		µg/m3	16	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
13. Chloroform	U		µg/m3	5.9	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
14. Chloromethane	U		µg/m3	12	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
15. Cyclohexane	U		µg/m3	41	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
16. Dibromochloromethane	U		µg/m3	4.1	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
20. Dichlorodifluoromethane	U	V+	µg/m3	30	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
22. 1,2-Dichloroethane	U	V+	µg/m3	4.9	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
29. 1,4-Dioxane	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
31. Ethylbenzene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
33. n-Heptane	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
35. n-Hexane	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM

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Analytical Laboratory Report
Laboratory Project Number: A16920
Laboratory Sample Number: A16920-002

Order: A16920
Date: 09/05/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01 (082923)**	Chain of Custody:	**220154**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**08/29/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A16920-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01 (082923)**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 37. Isopropanol	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
39. Methylene Chloride	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
40. MTBE	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 41. Naphthalene	U		µg/m3	19	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
42. Styrene	U		µg/m3	51	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
43. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
44. Tetrachloroethene	U		µg/m3	41	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 45. Tetrahydrofuran	U		µg/m3	3.5	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
46. Toluene	U		µg/m3	23	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
47. 1,2,4-Trichlorobenzene	U		µg/m3	22	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
48. 1,1,1-Trichloroethane	U	V+	µg/m3	33	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
49. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
50. Trichloroethene	**3.3**		µg/m3	1.6	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
51. Trichlorofluoromethane	U	V+	µg/m3	34	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 52. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
53. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
54. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
55. Vinyl Acetate	U		µg/m3	42	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
56. Vinyl Chloride	U		µg/m3	15	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
57. m&p-Xylene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
58. o-Xylene	U		µg/m3	52	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM
‡ 59. Xylenes	U		µg/m3	100	4.0	08/31/23	VQ23H31B	08/31/23 23:22	VQ23H31B	CM

Surrogate Summary			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**101**	%	80-120	VQ	VQ23H31B	8/31/2023 23:22	1	VQ400

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QC limits
D: The sample or extract was analyzed at a DF greater than 1.

Exception Summary:

V+ : Recovery in the associated continuing calibration verification sample (CCV) exceeds the upper control limit. Results may be biased high.

Analysis Locations:

All analyses performed in Holt.

NELAP ACCREDITED TNI LABORATORY

Accreditation Number(s):

T104704518-23-15 (TX)

VQ23H31B: Method Blank (MB)

EPA TO-15

Run Time: VQ23H31B.MB 08/31/2023 13:35 [VQ23H31B]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Acetone	U		57
Benzene	U		19
Benzyl Chloride	U		6.2
Bromodichloromethane	U		8.0
Bromoform	U		62
Bromomethane	U		23
1,3-Butadiene	U		2.7
2-Butanone	U		35
Carbon Disulfide	U		37
Carbon Tetrachloride	U		7.5
Chlorobenzene	U		28
Chloroethane	U		16
Chloroform	U		5.9
Chloromethane	U		12
Cyclohexane	U		41
Dibromochloromethane	U		4.1
1,2-Dichlorobenzene	U		36
1,3-Dichlorobenzene	U		36
1,4-Dichlorobenzene	U		36
Dichlorodifluoromethane	U		30
1,1-Dichloroethane	U		24
1,2-Dichloroethane	U		4.9
1,1-Dichloroethene	U		24
cis-1,2-Dichloroethene	U		24
trans-1,2-Dichloroethene	U		24
1,2-Dichloropropane	U		28
cis-1,3-Dichloropropene	U		27
trans-1,3-Dichloropropene	U		27
1,4-Dioxane	U		22
Ethyl Acetate	U		43
Ethylbenzene	U		52

VQ23H31B: Method Blank (MB)

EPA TO-15

Run Time: VQ23H31B.MB 08/31/2023 13:35 [VQ23H31B]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Ethylene Dibromide	U		0.92
n-Heptane	U		49
Hexachlorobutadiene	U		5.1
n-Hexane	U		42
2-Hexanone	U		49
Isopropanol	U		29
4-Methyl-2-pentanone	U		49
Methylene Chloride	U		42
MTBE	U		22
Naphthalene	U		19
Styrene	U		51
1,1,2,2-Tetrachloroethane	U		3.3
Tetrachloroethene	U		41
Tetrahydrofuran	U		3.5
Toluene	U		23
1,2,4-Trichlorobenzene	U		22
1,1,1-Trichloroethane	U		33
1,1,2-Trichloroethane	U		6.5
Trichloroethene	U		1.6
Trichlorofluoromethane	U		34
1,1,2-Trichlorotrifluoroethane	U		46
1,2,4-Trimethylbenzene	U		29
1,3,5-Trimethylbenzene	U		29
Vinyl Acetate	U		42
Vinyl Chloride	U		15
m&p-Xylene	U		52
o-Xylene	U		52
4-Bromofluorobenzene(S)	*99*		*80-120*

VQ23H31B: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23H31B.LCS: 08/31/2023 10:47 [VQ23H31B] VQ23H31B.LCSD: 08/31/2023 11:42 [VQ23H31B]

Analyte	LCS Spike Amount µg/m3	LCS Result µg/m3	LCS Rec. %	Rec. Limits %	LCS Qualifier	LCSD Spike Amount µg/m3	LCSD Result µg/m3	LCSD Rec. %	LCSD Qualifier	RPD %	RPD Limits %	RPD Qualifier
Acetone	31.2	24.5	79	70-130		31.2	24.9	80		1	20	
Benzene	42.7	37.2	87	70-130		42.7	37.1	87		0	20	
Benzyl Chloride	66.6	59.6	89	70-150		66.6	59.7	90		1	20	
Bromodichloromethane	87.9	90.8	103	70-130		87.9	90.7	103		0	20	
Bromoform	134	131	97	70-138		134	133	99		2	20	
Bromomethane	51.4	49.8	97	70-133		51.4	50.1	97		0	20	
1,3-Butadiene	29.6	26.8	90	70-134		29.6	27.0	91		1	20	
2-Butanone	39.8	33.0	83	70-130		39.8	32.8	83		0	20	
Carbon Disulfide	41.2	34.0	82	70-130		41.2	34.0	82		0	20	
Carbon Tetrachloride	80.2	93.9	117	70-131		80.2	93.9	117		0	20	
Chlorobenzene	61.5	52.1	85	70-130		61.5	52.7	86		1	20	
Chloroethane	34.9	32.2	92	70-130		34.9	32.5	93		1	20	
Chloroform	64.7	66.7	103	70-130		64.7	66.2	102		1	20	
Chloromethane	27.1	24.3	90	70-130		27.1	24.7	91		1	20	
Cyclohexane	45.6	43.0	94	70-130		45.6	43.0	94		0	20	
Dibromochloromethane	113	109	97	70-135		113	110	98		1	20	
1,2-Dichlorobenzene	75.9	68.5	90	70-130		75.9	68.8	91		1	20	
1,3-Dichlorobenzene	76.6	68.1	89	70-131		76.6	68.2	89		0	20	
1,4-Dichlorobenzene	75.9	66.5	88	70-134		75.9	67.1	88		0	20	
Dichlorodifluoromethane	65.5	71.6	109	70-132		65.5	69.9	107		2	20	
1,1-Dichloroethane	53.6	49.6	93	70-130		53.6	49.8	93		0	20	
1,2-Dichloroethane	54.1	58.5	108	70-130		54.1	58.6	108		0	20	
1,1-Dichloroethene	54.0	52.9	98	70-133		54.0	53.3	99		1	20	
cis-1,2-Dichloroethene	53.0	51.5	97	70-130		53.0	51.6	97		0	20	
trans-1,2-Dichloroethene	53.0	50.4	95	70-130		53.0	50.4	95		0	20	
1,2-Dichloropropane	61.8	53.6	87	70-130		61.8	53.4	87		0	20	
cis-1,3-Dichloropropene	60.7	58.4	96	70-131		60.7	58.8	97		1	20	
trans-1,3-Dichloropropene	59.5	60.6	102	70-134		59.5	60.0	101		1	20	
1,4-Dioxane	47.3	47.8	101	70-130		47.3	47.4	100		1	20	
Ethyl Acetate	47.3	42.3	89	70-130		47.3	41.8	88		1	20	
Ethylbenzene	57.5	50.6	88	70-130		57.5	50.9	89		1	20	

VQ23H31B: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23H31B.LCS: 08/31/2023 10:47 [VQ23H31B] VQ23H31B.LCSD: 08/31/2023 11:42 [VQ23H31B]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Ethylene Dibromide	102	91.8	90	70-130		102	93.1	91		1	20	
n-Heptane	54.3	50.3	93	70-132		54.3	50.2	92		1	20	
Hexachlorobutadiene	123	108	88	70-134		123	109	89		1	20	
n-Hexane	48.0	41.2	86	70-130		48.0	41.4	86		0	20	
2-Hexanone	55.3	49.9	90	70-139		55.3	49.8	90		0	20	
Isopropanol	33.5	26.4	79	54-144		33.5	26.6	79		0	20	
4-Methyl-2-pentanone	54.3	53.5	99	70-130		54.3	52.9	97		2	20	
Methylene Chloride	44.7	38.5	86	70-132		44.7	38.6	86		0	20	
MTBE	48.2	49.9	104	70-130		48.2	49.8	103		1	20	
Naphthalene	61.6	65.8	107	70-148		61.6	65.7	107		0	20	
Styrene	55.4	48.5	88	70-130		55.4	48.8	88		0	20	
1,1,2,2-Tetrachloroethane	90.1	71.7	80	70-130		90.1	72.1	80		0	20	
Tetrachloroethene	89.8	84.2	94	70-130		89.8	84.5	94		0	20	
Tetrahydrofuran	38.0	33.1	87	70-138		38.0	32.7	86		1	20	
Toluene	50.4	42.0	83	70-130		50.4	42.4	84		1	20	
1,2,4-Trichlorobenzene	83.5	83.9	101	70-140		83.5	83.6	100		1	20	
1,1,1-Trichloroethane	73.6	80.5	109	70-130		73.6	80.1	109		0	20	
1,1,2-Trichloroethane	72.9	63.5	87	70-130		72.9	64.4	88		1	20	
Trichloroethene	71.8	72.2	100	70-130		71.8	72.1	100		0	20	
Trichlorofluoromethane	73.7	80.0	108	70-132		73.7	80.0	108		0	20	
1,1,2-Trichlorotrifluoroethane	102	100	98	70-130		102	99.9	98		0	20	
1,2,4-Trimethylbenzene	62.7	59.4	95	70-132		62.7	59.6	95		0	20	
1,3,5-Trimethylbenzene	63.9	59.8	94	70-131		63.9	60.3	94		0	20	
Vinyl Acetate	48.4	40.2	83	70-131		48.4	39.6	82		1	20	
Vinyl Chloride	33.5	31.8	95	70-131		33.5	31.9	95		0	20	
m&p-Xylene	114	108	94	70-130		114	109	95		1	20	
o-Xylene	56.4	49.0	87	70-130		56.4	49.4	88		1	20	
4-Bromofluorobenzene(S)			*102*	*80-120*				*102*				

Definitions/ Qualifiers:

U: The analyte was not detected at or above the Reporting Limit (RL).
***:** Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Bailey Welch

By Bailey Welch at 11:24 AM, Jun 13, 2024

Fibertec environmental services

Analytical Laboratory

1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
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8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
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Geoprobe

11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 220154

PAGE 1 of 1

Client Name: Arcadis

Contact Person: Kaitlyn Hunt

Project Name/ Number: RACER Lansing / 30171056.00102

Email distribution list: Kaitlyn.Hunt@arcadis.com; Tiffany.Linder@arcadis.com

Quote#

Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PARAMETERS: TO-15	HOLD SAMPLE
8/29/23	0930	1	SVMP-20-01(082923)	A	1	X	
8/29/23	——	2	DUP-01(082923)	A	1	X	

Matrix Code: S Soil; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Deliverables: Level 2; Level 3; Level 4; EDD

Remarks:

Received By Lab
AUG 29 2023
Initials: BP

Comments:

Sampled/Relinquished By: Austin Westhuis/Arcadis	Date/ Time 8/29/23 1500	Received By:
Relinquished By:	Date/ Time	Received By:
Relinquished By:	Date/ Time	Received By Laboratory:

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days

X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY

Fibertec project number: A16920

Temperature upon receipt at Lab: Room Temp

Please see back for terms and conditions

Fibertec environmental services
A METIRI GROUP COMPANY

Monday, November 6, 2023

Fibertec Project Number:	A18065
Project Identification:	RACER Lansing (30171056.00102) /30171056.00102
Submittal Date:	10/27/2023

Ms. Kaitlyn Hunt
Arcadis U.S., Inc. - Novi
28550 Cabot Drive
Suite 500
Novi, MI 48377

Dear Ms. Hunt,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

By Jacob Sutherlund at 1:02 PM, Nov 06, 2023

For Heather L. Smith
Director of Laboratory Operations

Enclosures

Analytical Laboratory Report
Laboratory Project Number: A18065
Laboratory Sample Number: A18065-001

Order: A18065
Date: 11/06/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01_102723**	Chain of Custody:	**215245**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**10/27/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**13:15**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A18065-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01_102723**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
2. Benzene	U		µg/m3	19	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
3. Benzyl Chloride	U		µg/m3	6.2	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
4. Bromodichloromethane	U		µg/m3	8.0	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
5. Bromoform	U		µg/m3	62	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
6. Bromomethane	U		µg/m3	23	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
8. 2-Butanone	U		µg/m3	35	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
11. Chlorobenzene	U		µg/m3	28	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
12. Chloroethane	U		µg/m3	16	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
13. Chloroform	U		µg/m3	5.9	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
14. Chloromethane	U		µg/m3	12	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
15. Cyclohexane	U		µg/m3	41	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
16. Dibromochloromethane	U		µg/m3	4.1	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
29. 1,4-Dioxane	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
31. Ethylbenzene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
33. n-Heptane	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
35. n-Hexane	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM

Analytical Laboratory Report
Laboratory Project Number: A18065
Laboratory Sample Number: A18065-001

Order: A18065
Date: 11/06/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**SVMP-20-01_102723**	Chain of Custody:	**215245**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**1**	Collect Date:	**10/27/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**13:15**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A18065-001** **Matrix: Air**
Method: EPA TO-15 **Description: SVMP-20-01_102723**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 37. Isopropanol	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
39. Methylene Chloride	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
40. MTBE	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 41. Naphthalene	U		µg/m3	19	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
42. Styrene	U		µg/m3	51	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
43. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
44. Tetrachloroethene	U		µg/m3	41	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 45. Tetrahydrofuran	U		µg/m3	3.5	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
46. Toluene	U		µg/m3	23	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
47. 1,2,4-Trichlorobenzene	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
48. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
49. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
50. Trichloroethene	U		µg/m3	1.6	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
51. Trichlorofluoromethane	U		µg/m3	34	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 52. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
53. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
54. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
55. Vinyl Acetate	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
56. Vinyl Chloride	U		µg/m3	15	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
57. m&p-Xylene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
58. o-Xylene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM
‡ 59. Xylenes	U		µg/m3	100	4.0	10/31/23	VQ23J31A	10/31/23 17:39	VQ23J31A	CM

Surrogate Summary

			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**102**	%	80-120	VQ	VQ23J31A	10/31/2023 17:39	1	VQ400

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01_102723**	Chain of Custody:	**215245**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**10/27/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A18065-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01_102723**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 1. Acetone	U		µg/m3	57	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
2. Benzene	U		µg/m3	19	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
3. Benzyl Chloride	U		µg/m3	6.2	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
4. Bromodichloromethane	U		µg/m3	8.0	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
5. Bromoform	U		µg/m3	62	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
6. Bromomethane	U		µg/m3	23	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
7. 1,3-Butadiene	U		µg/m3	2.7	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
8. 2-Butanone	U		µg/m3	35	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 9. Carbon Disulfide	U		µg/m3	37	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
10. Carbon Tetrachloride	U		µg/m3	7.5	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
11. Chlorobenzene	U		µg/m3	28	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
12. Chloroethane	U		µg/m3	16	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
13. Chloroform	U		µg/m3	5.9	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
14. Chloromethane	U		µg/m3	12	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
15. Cyclohexane	U		µg/m3	41	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
16. Dibromochloromethane	U		µg/m3	4.1	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
17. 1,2-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
18. 1,3-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
19. 1,4-Dichlorobenzene	U		µg/m3	36	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
20. Dichlorodifluoromethane	U		µg/m3	30	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
21. 1,1-Dichloroethane	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
22. 1,2-Dichloroethane	U		µg/m3	4.9	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
23. 1,1-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
24. cis-1,2-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
25. trans-1,2-Dichloroethene	U		µg/m3	24	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
26. 1,2-Dichloropropane	U		µg/m3	28	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
27. cis-1,3-Dichloropropene	U		µg/m3	27	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
28. trans-1,3-Dichloropropene	U		µg/m3	27	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
29. 1,4-Dioxane	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 30. Ethyl Acetate	U		µg/m3	43	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
31. Ethylbenzene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
32. Ethylene Dibromide	U		µg/m3	0.92	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
33. n-Heptane	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
34. Hexachlorobutadiene	U		µg/m3	5.1	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
35. n-Hexane	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 36. 2-Hexanone	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM

Fibertec environmental services
A METIRI GROUP COMPANY

Analytical Laboratory Report
Laboratory Project Number: A18065
Laboratory Sample Number: A18065-002

Order: A18065
Date: 11/06/23

Client Identification:	**Arcadis U.S., Inc. - Novi**	Sample Description:	**DUP-01_102723**	Chain of Custody:	**215245**
Client Project Name:	**RACER Lansing (30171056.00102)**	Sample No:	**2**	Collect Date:	**10/27/23**
Client Project No:	**30171056.00102**	Sample Matrix:	**Air**	Collect Time:	**NA**

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

TO-15 (Bottle-Vac) **Aliquot ID: A18065-002** **Matrix: Air**
Method: EPA TO-15 **Description: DUP-01_102723**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation P. Date	Preparation P. Batch	Analysis A. Date	Analysis A. Batch	Init.
‡ 37. Isopropanol	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
38. 4-Methyl-2-pentanone	U		µg/m3	49	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
39. Methylene Chloride	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
40. MTBE	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 41. Naphthalene	U		µg/m3	19	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
42. Styrene	U		µg/m3	51	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
43. 1,1,2,2-Tetrachloroethane	U		µg/m3	3.3	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
44. Tetrachloroethene	U		µg/m3	41	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 45. Tetrahydrofuran	U		µg/m3	3.5	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
46. Toluene	U		µg/m3	23	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
47. 1,2,4-Trichlorobenzene	U		µg/m3	22	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
48. 1,1,1-Trichloroethane	U		µg/m3	33	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
49. 1,1,2-Trichloroethane	U		µg/m3	6.5	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
50. Trichloroethene	U		µg/m3	1.6	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
51. Trichlorofluoromethane	U		µg/m3	34	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 52. 1,1,2-Trichlorotrifluoroethane	U		µg/m3	46	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
53. 1,2,4-Trimethylbenzene	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
54. 1,3,5-Trimethylbenzene	U		µg/m3	29	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
55. Vinyl Acetate	U		µg/m3	42	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
56. Vinyl Chloride	U		µg/m3	15	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
57. m&p-Xylene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
58. o-Xylene	U		µg/m3	52	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM
‡ 59. Xylenes	U		µg/m3	100	4.0	10/31/23	VQ23J31A	10/31/23 18:32	VQ23J31A	CM

Surrogate Summary

			Control Limits	Instrument	Batch	Run Time	Column	Inst. Method
4-Bromofluorobenzene(S)	**101**	%	80-120	VQ	VQ23J31A	10/31/2023 18:32	1	VQ400

Definitions/ Qualifiers:

A: Spike recovery or precision unusable due to dilution.
B: The analyte was detected in the associated method blank.
E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
J: The concentration is an estimated value.
M: Modified Method
U: The analyte was not detected at or above the reporting limit.
X: Matrix Interference has resulted in a raised reporting limit or distorted result.
W: Results reported on a wet-weight basis.
***:** Value reported is outside QC limits
D: The sample or extract was analyzed at a DF greater than 1.

Exception Summary:

Analysis Locations:

All analyses performed in Holt.

NELAP ACCREDITED TNI LABORATORY

Accreditation Number(s):

T104704518-23-15 (TX)

VQ23J31A: Method Blank (MB)

EPA TO-15

Run Time: VQ23J31A.MB 10/31/2023 12:50 [VQ23J31A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Acetone	U		57
Benzene	U		19
Benzyl Chloride	U		6.2
Bromodichloromethane	U		8.0
Bromoform	U		62
Bromomethane	U		23
1,3-Butadiene	U		2.7
2-Butanone	U		35
Carbon Disulfide	U		37
Carbon Tetrachloride	U		7.5
Chlorobenzene	U		28
Chloroethane	U		16
Chloroform	U		5.9
Chloromethane	U		12
Cyclohexane	U		41
Dibromochloromethane	U		4.1
1,2-Dichlorobenzene	U		36
1,3-Dichlorobenzene	U		36
1,4-Dichlorobenzene	U		36
Dichlorodifluoromethane	U		30
1,1-Dichloroethane	U		24
1,2-Dichloroethane	U		4.9
1,1-Dichloroethene	U		24
cis-1,2-Dichloroethene	U		24
trans-1,2-Dichloroethene	U		24
1,2-Dichloropropane	U		28
cis-1,3-Dichloropropene	U		27
trans-1,3-Dichloropropene	U		27
1,4-Dioxane	U		22
Ethyl Acetate	U		43
Ethylbenzene	U		52

VQ23J31A: Method Blank (MB)

EPA TO-15

Run Time: VQ23J31A.MB 10/31/2023 12:50 [VQ23J31A]

Analyte	MB Result	MB Qualifier	MB RDL
	µg/m3		µg/m3
Ethylene Dibromide	U		0.92
n-Heptane	U		49
Hexachlorobutadiene	U		5.1
n-Hexane	U		42
2-Hexanone	U		49
Isopropanol	U		29
4-Methyl-2-pentanone	U		49
Methylene Chloride	U		42
MTBE	U		22
Naphthalene	U		19
Styrene	U		51
1,1,2,2-Tetrachloroethane	U		3.3
Tetrachloroethene	U		41
Tetrahydrofuran	U		3.5
Toluene	U		23
1,2,4-Trichlorobenzene	U		22
1,1,1-Trichloroethane	U		33
1,1,2-Trichloroethane	U		6.5
Trichloroethene	U		1.6
Trichlorofluoromethane	U		34
1,1,2-Trichlorotrifluoroethane	U		46
1,2,4-Trimethylbenzene	U		29
1,3,5-Trimethylbenzene	U		29
Vinyl Acetate	U		42
Vinyl Chloride	U		15
m&p-Xylene	U		52
o-Xylene	U		52
4-Bromofluorobenzene(S)	*102*		*80-120*

VQ23J31A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23J31A.LCS: 10/31/2023 10:02 [VQ23J31A] VQ23J31A.LCSD: 10/31/2023 10:57 [VQ23J31A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Acetone	31.2	26.8	86	70-130		31.2	26.8	86		0	20	
Benzene	42.7	38.4	90	70-130		42.7	38.7	91		1	20	
Benzyl Chloride	66.6	74.7	112	70-150		66.6	73.9	111		1	20	
Bromodichloromethane	87.9	82.9	94	70-130		87.9	84.4	96		2	20	
Bromoform	134	137	102	70-138		134	136	101		1	20	
Bromomethane	51.4	50.0	97	70-133		51.4	49.9	97		0	20	
1,3-Butadiene	29.6	28.7	97	70-134		29.6	28.3	96		1	20	
2-Butanone	39.8	32.0	81	70-130		39.8	32.2	81		0	20	
Carbon Disulfide	41.2	34.4	83	70-130		41.2	34.3	83		0	20	
Carbon Tetrachloride	80.2	76.6	96	70-131		80.2	77.5	97		1	20	
Chlorobenzene	61.5	62.8	102	70-130		61.5	62.4	101		1	20	
Chloroethane	34.9	33.5	96	70-130		34.9	33.2	95		1	20	
Chloroform	64.7	61.7	95	70-130		64.7	61.1	95		0	20	
Chloromethane	27.1	25.2	93	70-130		27.1	25.1	93		0	20	
Cyclohexane	45.6	45.2	99	70-130		45.6	45.7	100		1	20	
Dibromochloromethane	113	117	103	70-135		113	116	103		0	20	
1,2-Dichlorobenzene	75.9	81.2	107	70-130		75.9	81.1	107		0	20	
1,3-Dichlorobenzene	76.6	83.2	109	70-131		76.6	82.6	108		1	20	
1,4-Dichlorobenzene	75.9	84.5	111	70-134		75.9	83.7	110		1	20	
Dichlorodifluoromethane	65.5	65.3	100	70-132		65.5	64.4	98		2	20	
1,1-Dichloroethane	53.6	51.3	96	70-130		53.6	51.7	96		0	20	
1,2-Dichloroethane	54.1	50.5	93	70-130		54.1	50.4	93		0	20	
1,1-Dichloroethene	54.0	51.0	94	70-133		54.0	51.0	94		0	20	
cis-1,2-Dichloroethene	53.0	51.0	96	70-130		53.0	51.3	97		1	20	
trans-1,2-Dichloroethene	53.0	51.0	96	70-130		53.0	50.9	96		0	20	
1,2-Dichloropropane	61.8	58.2	94	70-130		61.8	58.6	95		1	20	
cis-1,3-Dichloropropene	60.7	60.3	99	70-131		60.7	60.6	100		1	20	
trans-1,3-Dichloropropene	59.5	58.7	99	70-134		59.5	59.6	100		1	20	
1,4-Dioxane	47.3	53.3	113	70-130		47.3	54.5	115		2	20	
Ethyl Acetate	47.3	48.2	102	70-130		47.3	48.2	102		0	20	
Ethylbenzene	57.5	58.9	102	70-130		57.5	58.5	102		0	20	

VQ23J31A: Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

EPA TO-15

Run Time: VQ23J31A.LCS: 10/31/2023 10:02 [VQ23J31A] VQ23J31A.LCSD: 10/31/2023 10:57 [VQ23J31A]

Analyte	LCS Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier	LCSD Spike Amount	LCSD Result	LCSD Rec.	LCSD Qualifier	RPD	RPD Limits	RPD Qualifier
	µg/m3	µg/m3	%	%		µg/m3	µg/m3	%		%	%	
Ethylene Dibromide	102	106	104	70-130		102	105	104		0	20	
n-Heptane	54.3	52.2	96	70-132		54.3	52.9	97		1	20	
Hexachlorobutadiene	123	134	109	70-134		123	132	107		2	20	
n-Hexane	48.0	45.5	95	70-130		48.0	45.6	95		0	20	
2-Hexanone	55.3	60.3	109	70-139		55.3	60.3	109		0	20	
Isopropanol	33.5	30.8	92	54-144		33.5	31.1	93		1	20	
4-Methyl-2-pentanone	54.3	56.0	103	70-130		54.3	56.8	105		2	20	
Methylene Chloride	44.7	36.5	82	70-132		44.7	36.7	82		0	20	
MTBE	48.2	49.1	102	70-130		48.2	48.9	102		0	20	
Naphthalene	61.6	84.1	137	70-148		61.6	83.8	136		1	20	
Styrene	55.4	58.2	105	70-130		55.4	57.5	104		1	20	
1,1,2,2-Tetrachloroethane	90.1	87.4	97	70-130		90.1	86.5	96		1	20	
Tetrachloroethene	89.8	98.0	109	70-130		89.8	97.3	108		1	20	
Tetrahydrofuran	38.0	36.4	96	70-138		38.0	36.5	96		0	20	
Toluene	50.4	47.7	95	70-130		50.4	47.2	94		1	20	
1,2,4-Trichlorobenzene	83.5	96.4	115	70-140		83.5	97.4	117		2	20	
1,1,1-Trichloroethane	73.6	71.3	97	70-130		73.6	72.3	98		1	20	
1,1,2-Trichloroethane	72.9	74.6	102	70-130		72.9	74.3	102		0	20	
Trichloroethene	71.8	69.6	97	70-130		71.8	70.2	98		1	20	
Trichlorofluoromethane	73.7	71.7	97	70-132		73.7	71.7	97		0	20	
1,1,2-Trichlorotrifluoroethane	102	98.7	96	70-130		102	98.1	96		0	20	
1,2,4-Trimethylbenzene	62.7	64.1	102	70-132		62.7	63.2	101		1	20	
1,3,5-Trimethylbenzene	63.9	63.3	99	70-131		63.9	62.6	98		1	20	
Vinyl Acetate	48.4	53.0	110	70-131		48.4	52.5	109		1	20	
Vinyl Chloride	33.5	33.0	98	70-131		33.5	33.0	98		0	20	
m&p-Xylene	114	121	106	70-130		114	120	105		1	20	
o-Xylene	56.4	57.1	101	70-130		56.4	56.3	100		1	20	
4-Bromofluorobenzene(S)			*108*	*80-120*				*105*				

Definitions/ Qualifiers:

U: The analyte was not detected at or above the Reporting Limit (RL).
***:** Value reported is outside QC limits

Exception Summary:

Exceptions have been properly noted on reported results or affected samples have been scheduled for reanalysis when appropriate.

Report Generated By:

Bailey Welch

By Bailey Welch at 11:47 AM, Jun 13, 2024

Fibertec environmental services

Analytical Laboratory

1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
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Geoprobe
11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 215245
PAGE 1 of 1

Client Name: Arcadis
Contact Person: Kaitlyn Hunt
Project Name/ Number: RACER Lansing / 30171056.00102
Email distribution list: Kaitlyn.Hunt@arcadis.com, Tiffany.Linder@arcadis.com
Quote#
Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PARAMETERS: TO-15	HOLD SAMPLE
10/27/23	1315	1	SVMP-20-01_102723	A	1	X	
10/27/23	———	2	DUP-01_102723	A	1	X	

Matrix Code: S Soil; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Deliverables: Level 2; Level 3; Level 4; EDD

Remarks:

Received By Lab
OCT 27 2023
Initials: TM

Comments:

Sampled/Relinquished By: Austin Westhuis / Arcadis — Date/ Time: 10/27/23 1405 — Received By:
Relinquished By: — Date/ Time: — Received By:
Relinquished By: — Date/ Time: — Received By Laboratory:

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days

X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY
Fibertec project number: A18065
Temperature upon receipt at Lab: Rm. Temp.

Please see back for terms and conditions

Appendix C-1

Low-Flow Groundwater Sampling Logs

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A06			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	19.9 degrees F and Light Snow. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.81	**Total Depth (ft-bmp)**	92.6	**Water Column (ft)**	23.79	**Gallons in Well**	3.87
Purge Start	11:35	**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:10	**Volumes Purged**	0.24	**Sample ID**	AS-19-A06_021723	**Sampled by**	Billy Cobern
Sample Time	12:10	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	100	68.81	0.00	0	0	0	0	0	0	Clear	None
11:40	5	5	100	69.22	0.13	7.48	1.3	28	2.95	9.1	73.8	Clear	None
11:45	5	10	100	69.50	0.26	7.49	1.37	27.1	1.25	5	75.6	Clear	None
11:50	5	15	100	69.74	0.40	7.53	1.32	26.3	1.07	4.3	71.7	Clear	None
11:55	5	20	100	69.98	0.53	7.52	1.31	25.3	1.07	5.7	63.9	Clear	None
12:00	5	25	100	70.21	0.66	7.52	1.31	23.8	1.24	6	56.9	Clear	None
12:05	5	30	100	70.44	0.79	7.52	1.31	22.1	1.26	6.1	53.6	Clear	None
12:10	5	35	100	70.62	0.92	7.52	1.31	21	1.27	6.2	52.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A07			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.51	**Total Depth (ft-bmp)**	91.2	**Water Column (ft)**	21.69	**Gallons in Well**	3.52
Purge Start	10:20	**Pump Intake (ft-bmp)**	89	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:00	**Volumes Purged**	0.30	**Sample ID**	AS-19-A07_021723	**Sampled by**	Billy Cobern
Sample Time	11:00	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	100	69.51	0.00	0	0	0	0	0	0	Clear	None
10:25	5	5	100	70.50	0.13	7.04	1.62	31	4.34	7.4	68.7	Clear	None
10:30	5	10	100	71.48	0.26	7.04	1.62	28.3	4.4	6.9	68.4	Clear	None
10:35	5	15	100	72.40	0.40	7.04	1.66	21.7	4.74	5.1	68.4	Clear	None
10:40	5	20	100	73.42	0.53	7.05	1.65	23.1	4.8	2.3	68.7	Clear	None
10:45	5	25	100	74.39	0.66	7.06	1.68	20.5	4.65	2.1	68.2	Clear	None
10:50	5	30	100	75.35	0.79	7.07	1.68	20.8	4.59	2.2	67.7	Clear	None
10:55	5	35	100	76.31	0.92	7.07	1.67	21.3	4.49	2.3	67.5	Clear	None
11:00	5	40	100	77.32	1.06	7.08	1.66	21.2	4.5	2.3	66.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-12			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.68	**Total Depth (ft-bmp)**	17.2	**Water Column (ft)**	11.52	**Gallons in Well**	1.87
Purge Start	11:20	**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:55	**Volumes Purged**	0.49	**Sample ID**	MW-12-12_021523	**Sampled by**	Billy Cobern
Sample Time	11:55	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	DUP-05_021523	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:20	0	0	100	5.68	0.00	0	0	0	0	0	0	Clear	None
11:25	5	5	100	6.20	0.13	7.74	0.71	23.4	1.06	9.9	32.4	Clear	None
11:30	5	10	100	6.86	0.26	7.81	0.698	18	0.83	9.9	31.3	Clear	None
11:35	5	15	100	7.22	0.40	7.82	0.699	15.2	0.62	10	32.1	Clear	None
11:40	5	20	100	7.65	0.53	7.81	0.71	12.3	0.57	10	35	Clear	None
11:45	5	25	100	7.99	0.66	7.76	0.72	9.6	0.53	10	36.9	Clear	None
11:50	5	30	100	8.41	0.79	7.73	0.73	9.45	0.52	10	38.9	Clear	None
11:55	5	35	100	8.80	0.92	7.69	0.74	9.21	0.49	10.1	40.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Missing bolts
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-13			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	48.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.64	**Total Depth (ft-bmp)**	25.4	**Water Column (ft)**	15.76	**Gallons in Well**	2.56
Purge Start	13:40	**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:20	**Volumes Purged**	0.41	**Sample ID**	MW-12-13_021523	**Sampled by**	Billy Cobern
Sample Time	14:20	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	100	9.64	0.00	0	0	0	0	0	0	Clear	None
13:45	5	5	100	10.02	0.13	7.65	0.79	10.8	7.92	7.8	50.6	Clear	None
13:50	5	10	100	10.43	0.26	7.58	0.78	8.13	6.87	8	54.7	Clear	None
13:55	5	15	100	10.88	0.40	7.54	0.75	5.65	5.87	8.1	60.1	Clear	None
14:00	5	20	100	11.23	0.53	7.52	0.74	4.96	5.51	8.3	62	Clear	None
14:05	5	25	100	11.60	0.66	7.5	0.74	4.72	5.03	8.4	62.9	Clear	None
14:10	5	30	100	11.92	0.79	7.49	0.74	4.93	4.68	8.4	62	Clear	None
14:15	5	35	100	12.25	0.92	7.49	0.74	4.52	4.61	8.4	61.8	Clear	None
14:20	5	40	100	12.49	1.06	7.49	0.73	4.2	4.59	8.4	61.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-21			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.92	**Total Depth (ft-bmp)**	78.04	**Water Column (ft)**	12.12	**Gallons in Well**	1.97
Purge Start	13:10	**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:45	**Volumes Purged**	0.54	**Sample ID**	MW-12-21_021723	**Sampled by**	Donald Richmond
Sample Time	13:45	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:25	0	0	200	65.92	0.79	7	1.17	42.8	1.86	8.2	-13.7	Clear	None
13:30	5	5	200	65.92	1.06	6.95	1.16	46.6	1.87	8	-8.9	Clear	None
13:35	5	10	200	65.92	1.32	6.9	1.1	55	1.6	5.6	-2.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-22			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	21.0 degrees F and Mostly Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.25	**Total Depth (ft-bmp)**	96.15	**Water Column (ft)**	26.90	**Gallons in Well**	4.37
Purge Start	13:00	**Pump Intake (ft-bmp)**	93.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:40	**Volumes Purged**	0.24	**Sample ID**	MW-13-22_021723	**Sampled by**	Billy Cobern
Sample Time	13:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	100	69.25	0.00	0	0	0	0	0	0	Clear	None
13:05	5	5	100	69.55	0.13	7.01	2.02	16.2	8.48	2.7	16.6	Clear	None
13:10	5	10	100	69.55	0.26	6.88	2.05	16.5	2.07	3.1	7.5	Clear	None
13:15	5	15	100	69.55	0.40	6.87	2.04	13.2	1.46	2.9	4.2	Clear	None
13:20	5	20	100	69.55	0.53	6.87	2.05	12.2	1.2	2.7	-1.3	Clear	None
13:25	5	25	100	69.55	0.66	6.88	2.05	10.1	0.78	2.6	-10.8	Clear	None
13:30	5	30	100	69.55	0.79	6.87	2.03	9.78	1.01	3.2	-19.1	Clear	None
13:35	5	35	100	69.55	0.92	6.87	2.04	9.4	0.99	3.4	-20.6	Clear	None
13:40	5	40	100	69.55	1.06	6.87	2.03	9.05	0.98	3.4	-21.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-34			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.97	**Total Depth (ft-bmp)**	79.75	**Water Column (ft)**	14.78	**Gallons in Well**	2.40
Purge Start	09:20	**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:29	**Volumes Purged**	1.43	**Sample ID**	MW-13-34_021723	**Sampled by**	Donald Richmond
Sample Time	10:30	**Gallons Purged**	3.4342367	**Replicate/ Code No.**	DUP-04_021723	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:50	0	0	200	64.97	1.59	7.2	1.36	47.7	1.51	7.3	107.9	Clear	None
09:55	5	5	200	64.97	1.85	7.22	1.39	47.8	0.88	7.6	85.4	Clear	None
10:00	5	10	200	64.97	2.11	7.17	1.43	72.5	0.4	8.1	58.2	Clear	None
10:05	5	15	200	64.97	2.38	7.15	1.48	121	0.22	7.9	30.4	Clear	None
10:10	5	20	200	64.97	2.64	7.11	1.53	119	0.17	8	16	Clear	None
10:15	5	25	200	64.97	2.91	7.06	1.59	118	0.16	7.8	-4.5	Clear	None
10:20	5	30	200	64.97	3.17	7.05	1.6	113	0.17	8.4	-15.9	Clear	None
10:25	5	35	200	64.97	3.43	7.03	1.62	119	0.16	8	-26.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-36R			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing S/SE at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.68	**Total Depth (ft-bmp)**	12.6	**Water Column (ft)**	7.92	**Gallons in Well**	1.29
Purge Start	15:30	**Pump Intake (ft-bmp)**	10.1	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:10	**Volumes Purged**	1.64	**Sample ID**	MW-13-36R_021423	**Sampled by**	Austin Westhuis
Sample Time	16:05	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:35	0	0	200	4.68	0.26	11.79	1.828	26.9	0.51	7.2	-316.8	Clear	None
15:40	5	5	200	4.68	0.53	11.81	1.857	13.8	0.6	7.2	-341.9	Clear	None
15:45	5	10	200	4.68	0.79	11.86	1.878	5.63	0.81	7.2	-363.3	Clear	None
15:50	5	15	200	4.68	1.06	11.92	1.907	3.59	0.84	7.3	-378.5	Clear	None
15:55	5	20	200	4.68	1.32	11.94	1.91	3.2	0.6	7.3	-384.3	Clear	None
16:00	5	25	200	4.68	1.59	11.97	1.909	3.02	0.58	7.3	-385.7	Clear	None
16:05	5	30	200	4.68	1.85	11.98	1.914	2.59	0.56	7.3	-389.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-58R			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	51.1 degrees F and Mostly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.17	**Total Depth (ft-bmp)**	29.61	**Water Column (ft)**	16.44	**Gallons in Well**	2.67
Purge Start	12:45	**Pump Intake (ft-bmp)**	27.11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:30	**Volumes Purged**	0.89	**Sample ID**	MW-14-58R_021523	**Sampled by**	Austin Westhuis
Sample Time	13:25	**Gallons Purged**	2.377548	**Replicate/ Code No.**	DUP-01_021523	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	200	13.17	0.26	7.26	2.777	22.6	1.21	12.9	-112.5	Clear	None
12:55	5	5	200	13.17	0.53	7.2	2.786	15.8	0.21	12.9	-131.5	Clear	None
13:00	5	10	200	13.17	0.79	7.18	2.793	11.9	0.17	13	-149	Clear	None
13:05	5	15	200	13.17	1.06	7.02	2.834	6.98	0.09	13	-154.9	Clear	None
13:10	5	20	200	13.17	1.32	7.01	2.842	7.01	0.07	13.1	-162.3	Clear	None
13:15	5	25	200	13.17	1.59	7.01	2.845	5.91	0.07	13	-165.2	Clear	None
13:20	5	30	200	13.17	1.85	7.01	2.841	5.43	0.07	13	-173.6	Clear	None
13:25	5	35	200	13.17	2.11	7.01	2.847	4.93	0.07	12.9	-175.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-67			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	57.0 degrees F and Clear. The wind is blowing S at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.40	**Total Depth (ft-bmp)**	20.83	**Water Column (ft)**	16.43	**Gallons in Well**	2.67
Purge Start	14:30	**Pump Intake (ft-bmp)**	18.33	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:15	**Volumes Purged**	0.89	**Sample ID**	MW-14-67_021423	**Sampled by**	Austin Westhuis
Sample Time	15:10	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:35	0	0	200	4.40	0.26	7.38	1.326	3.17	2.65	9.8	-145.5	Clear	None
14:40	5	5	200	4.40	0.53	7.29	1.339	2.58	1.94	9.8	-177.9	Clear	None
14:45	5	10	200	4.40	0.79	7.28	1.342	2.12	1.68	10	-189.6	Clear	None
14:50	5	15	200	4.40	1.06	7.29	1.344	1.91	1.48	10	-197.2	Clear	None
14:55	5	20	200	4.40	1.32	7.27	1.362	1.65	1.12	10	-208.7	Clear	None
15:00	5	25	200	4.40	1.59	7.23	1.364	1.47	0.76	10	-218.4	Clear	None
15:05	5	30	200	4.40	1.85	7.22	1.363	1.41	0.73	10.1	-220.9	Clear	None
15:10	5	35	200	4.40	2.11	7.22	1.368	1.23	0.71	10.1	-222.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-70			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	51.1 degrees F and Mostly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.79	**Total Depth (ft-bmp)**	23.1	**Water Column (ft)**	13.31	**Gallons in Well**	2.16
Purge Start	12:30	**Pump Intake (ft-bmp)**	20.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:15	**Volumes Purged**	0.55	**Sample ID**	MW-14-70_021523	**Sampled by**	Billy Cobern
Sample Time	13:15	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	9.79	0.00	0	0	0	0	0	0	Clear	None
12:35	5	5	100	10.11	0.13	7.34	1.5	11.8	1.51	9.6	65.2	Clear	None
12:40	5	10	100	10.11	0.26	7.37	1.51	9.9	0.81	9.5	64.5	Clear	None
12:45	5	15	100	10.11	0.40	7.38	1.51	8.93	0.75	9.3	63.8	Clear	None
12:50	5	20	100	10.11	0.53	7.38	1.51	7.83	0.56	9.1	63.3	Clear	None
12:55	5	25	100	10.11	0.66	7.37	1.51	7.34	0.64	9.2	62.8	Clear	None
13:00	5	30	100	10.11	0.79	7.35	1.52	7.17	0.79	9.5	62.8	Clear	None
13:05	5	35	100	10.11	0.92	7.35	1.52	7.67	0.57	9.4	62.1	Clear	None
13:10	5	40	100	10.11	1.06	7.34	1.51	7.2	0.55	9.5	62	Clear	None
13:15	5	45	100	10.11	1.19	7.34	1.51	7.48	0.52	9.5	62	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-78			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing NE at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.54	**Total Depth (ft-bmp)**	76.18	**Water Column (ft)**	11.64	**Gallons in Well**	1.89
Purge Start	10:45	**Pump Intake (ft-bmp)**	74.68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:50	**Volumes Purged**	1.82	**Sample ID**	MW-16-78_021623	**Sampled by**	Austin Westhuis
Sample Time	11:20	**Gallons Purged**	3.4342367	**Replicate/ Code No.**	DUP-02_021623	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:50	0	0	200	64.54	0.26	7.1	1.483	206	0.68	11.9	-120.4	Clear	None
10:55	5	5	200	64.54	0.53	7.11	1.496	85.4	0.82	12.2	-124.5	Clear	None
11:00	5	10	200	64.54	0.79	7.09	1.494	22.6	0.95	12.2	-124.9	Clear	None
11:05	5	15	200	64.54	1.06	7.08	1.487	9.62	1.08	12.2	-124.4	Clear	None
11:10	5	20	200	64.54	1.32	7.06	1.489	3.09	1.19	12.1	-126	Clear	None
11:15	5	25	200	64.54	1.59	7.05	1.49	2.57	1.18	12.2	-125.4	Clear	None
11:20	5	30	200	64.54	1.85	7.04	1.491	2.12	1.22	12.2	-124	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	6	HCL
PFAS	250mL HDPE Plastic	4	None
SVOCs	1L Amber	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-88			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	28.9 degrees F and Fog/Mist. The wind is blowing NE at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.94	**Total Depth (ft-bmp)**	15.02	**Water Column (ft)**	10.08	**Gallons in Well**	1.64
Purge Start	15:15	**Pump Intake (ft-bmp)**	12.52	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:45	**Volumes Purged**	0.97	**Sample ID**	MW-18-88_021623	**Sampled by**	Austin Westhuis
Sample Time	15:40	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:20	0	0	200	4.98	0.26	7.06	0.672	4.89	0.25	6.4	-69.9	Clear	None
15:25	5	5	200	4.98	0.53	7.06	0.667	2.02	0.15	6.3	-87	Clear	None
15:30	5	10	200	4.98	0.79	7.06	0.667	1.71	0.13	6.3	-94.9	Clear	None
15:35	5	15	200	4.98	1.06	7.07	0.668	1.51	0.12	6.3	-102.5	Clear	None
15:40	5	20	200	4.98	1.32	7.07	0.667	1.44	0.12	6.3	-104.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-89			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	17.1 degrees F and Clear. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.98	**Total Depth (ft-bmp)**	15.62	**Water Column (ft)**	8.64	**Gallons in Well**	1.40
Purge Start	08:45	**Pump Intake (ft-bmp)**	13.12	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:15	**Volumes Purged**	1.13	**Sample ID**	MW-18-89_021723	**Sampled by**	Austin Westhuis
Sample Time	09:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:50	0	0	200	8.90	0.26	7.39	0.815	2.48	3.16	6.8	-172.2	Clear	None
08:55	5	5	200	9.44	0.53	7.4	0.815	2.1	3.53	6.6	-168.5	Clear	None
09:00	5	10	200	9.69	0.79	7.41	0.815	1.67	3.26	6.6	-175.7	Clear	None
09:05	5	15	200	9.82	1.06	7.43	0.814	1.6	3.2	6.6	-179.6	Clear	None
09:10	5	20	200	9.89	1.32	7.43	0.814	1.33	3.18	6.6	-183.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well did not meet drawdown requirements.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-90			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	30.0 degrees F and Light Freezing Rain and Fog/Mist. The wind is blowing NE at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.97	**Total Depth (ft-bmp)**	23	**Water Column (ft)**	13.03	**Gallons in Well**	2.12
Purge Start	14:20	**Pump Intake (ft-bmp)**	20.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:55	**Volumes Purged**	0.87	**Sample ID**	MW-18-90_021623	**Sampled by**	Austin Westhuis
Sample Time	14:50	**Gallons Purged**	1.849204	**Replicate/ Code No.**	DUP-03_021623	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	200	9.97	0.26	12.11	2.049	22.9	1.1	9.8	-229.9	Clear	None
14:30	5	5	200	9.97	0.53	12.18	2.063	12.6	0.93	9.6	-243.2	Clear	None
14:35	5	10	200	9.97	0.79	12.19	2.101	4.38	0.69	9.7	-262.2	Clear	None
14:40	5	15	200	9.97	1.06	12.2	2.132	2.26	0.52	9.9	-274.4	Clear	None
14:45	5	20	200	9.97	1.32	12.21	2.141	2.06	0.5	9.9	-278.6	Clear	None
14:50	5	25	200	9.97	1.59	12.21	2.158	1.81	0.48	9.9	-284	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-91			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	17.1 degrees F and Clear. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.95	**Total Depth (ft-bmp)**	14.99	**Water Column (ft)**	9.04	**Gallons in Well**	1.47
Purge Start	09:20	**Pump Intake (ft-bmp)**	12.49	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:50	**Volumes Purged**	1.08	**Sample ID**	MW-18-91_021723	**Sampled by**	Austin Westhuis
Sample Time	09:45	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:25	0	0	200	7.35	0.26	7.52	0.71	3.12	0.56	6.6	-166.5	Clear	None
09:30	5	5	200	7.88	0.53	7.53	0.709	1.79	0.51	6.4	-150.3	Clear	None
09:35	5	10	200	8.09	0.79	7.55	0.708	1.47	0.49	6.5	-173.5	Clear	None
09:40	5	15	200	8.20	1.06	7.55	0.707	1.41	0.48	6.4	-178.8	Clear	None
09:45	5	20	200	8.24	1.32	7.55	0.707	1.23	0.47	6.4	-180.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well did not meet drawdown requirements.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-95			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	17.1 degrees F and Clear. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.56	**Total Depth (ft-bmp)**	12.45	**Water Column (ft)**	5.89	**Gallons in Well**	0.96
Purge Start	10:05	**Pump Intake (ft-bmp)**	9.95	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:35	**Volumes Purged**	1.65	**Sample ID**	MW-18-95_021723	**Sampled by**	Austin Westhuis
Sample Time	10:30	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	200	6.56	0.26	7.42	0.501	2.44	7.1	5.6	-3.9	Clear	None
10:15	5	5	200	6.56	0.53	7.41	0.502	2.08	7.16	5.4	6	Clear	None
10:20	5	10	200	6.56	0.79	7.4	0.506	1.94	7.05	5.3	6.9	Clear	None
10:25	5	15	200	6.56	1.06	7.39	0.509	1.55	7.07	5.4	9.5	Clear	None
10:30	5	20	200	6.56	1.32	7.37	0.514	1.5	7.1	5.3	13.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-98			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	30.9 degrees F and Fog/Mist. The wind is blowing N/NE at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.98	**Total Depth (ft-bmp)**	14.9	**Water Column (ft)**	10.92	**Gallons in Well**	1.77
Purge Start	13:30	**Pump Intake (ft-bmp)**	12.4	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:05	**Volumes Purged**	1.04	**Sample ID**	MW-18-98_021623	**Sampled by**	Austin Westhuis
Sample Time	14:00	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:35	0	0	200	3.98	0.26	7.7	1.606	2.89	0.31	6	-93.7	Clear	None
13:40	5	5	200	3.98	0.53	7.69	1.609	2.41	0.43	6	-104.9	Clear	None
13:45	5	10	200	3.98	0.79	7.65	1.614	1.81	0.52	6	-113.9	Clear	None
13:50	5	15	200	3.98	1.06	7.62	1.625	1.4	0.74	5.9	-114.4	Clear	None
13:55	5	20	200	3.98	1.32	7.59	1.628	1.22	0.79	5.9	-114.9	Clear	None
14:00	5	25	200	3.98	1.59	7.56	1.63	1.11	0.81	5.9	-116	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-99			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	28.9 degrees F and Light Freezing Rain and Fog/Mist. The wind is blowing NE at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.94	**Total Depth (ft-bmp)**	16.85	**Water Column (ft)**	12.91	**Gallons in Well**	2.10
Purge Start	16:00	**Pump Intake (ft-bmp)**	14.35	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:35	**Volumes Purged**	0.88	**Sample ID**	MW-18-99_021623	**Sampled by**	Austin Westhuis
Sample Time	16:30	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:05	0	0	200	4.04	0.26	7.83	1.661	2.46	3.27	6.8	-109.8	Clear	None
16:10	5	5	200	4.10	0.53	7.85	1.669	2.07	2.67	6.5	-142.7	Clear	None
16:15	5	10	200	4.12	0.79	7.85	1.648	1.71	2.57	6.6	-156.1	Clear	None
16:20	5	15	200	4.12	1.06	7.86	1.623	1.51	2	6.7	-164.5	Clear	None
16:25	5	20	200	4.12	1.32	7.88	1.613	1.44	2.06	6.7	-170.4	Clear	None
16:30	5	25	200	4.14	1.59	7.88	1.61	1.17	2.07	6.7	-172.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-103			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	19.9 degrees F and Light Snow. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.08	**Total Depth (ft-bmp)**	10.73	**Water Column (ft)**	8.65	**Gallons in Well**	1.41
Purge Start	12:10	**Pump Intake (ft-bmp)**	8.23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:50	**Volumes Purged**	1.50	**Sample ID**	MW-18-103_021723	**Sampled by**	Austin Westhuis
Sample Time	12:45	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	200	2.08	0.26	6.9	0.92	5.38	0.55	6.9	-99.3	Clear	None
12:20	5	5	200	2.08	0.53	6.84	0.923	2.19	0.32	6.8	-122.2	Clear	None
12:25	5	10	200	2.08	0.79	6.86	0.922	1.89	0.3	6.7	-132.1	Clear	None
12:30	5	15	200	2.08	1.06	6.87	0.918	1.65	0.32	6.8	-139.5	Clear	None
12:35	5	20	200	2.08	1.32	6.89	0.911	1.34	0.36	6.7	-147.1	Clear	None
12:40	5	25	200	2.08	1.59	6.9	0.903	1.24	0.38	6.6	-152	Clear	None
12:45	5	30	200	2.08	1.85	6.9	0.894	1.11	0.39	6.6	-155.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-105			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	21.0 degrees F and Mostly Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.95	**Total Depth (ft-bmp)**	11.2	**Water Column (ft)**	9.25	**Gallons in Well**	1.50
Purge Start	13:10	**Pump Intake (ft-bmp)**	8.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:40	**Volumes Purged**	1.06	**Sample ID**	MW-18-105_021723	**Sampled by**	Austin Westhuis
Sample Time	13:35	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	2.24	0.26	7.11	0.533	3.37	5.13	5.7	-92.4	Clear	None
13:20	5	5	200	2.34	0.53	7.11	0.526	1.89	5.19	5.4	-112.1	Clear	None
13:25	5	10	200	2.39	0.79	7.11	0.525	1.51	5.52	5.2	-121.3	Clear	None
13:30	5	15	200	2.41	1.06	7.11	0.521	1.43	5.51	5.2	-128	Clear	None
13:35	5	20	200	2.42	1.32	7.11	0.522	1.29	5.48	5.2	-130	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-121			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	34.0 degrees F and Cloudy. The wind is blowing NE at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.12	**Total Depth (ft-bmp)**	71.15	**Water Column (ft)**	6.03	**Gallons in Well**	0.98
Purge Start	08:40	**Pump Intake (ft-bmp)**	69	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:35	**Volumes Purged**	1.48	**Sample ID**	MW-19-121_021623	**Sampled by**	Billy Cobern
Sample Time	09:35	**Gallons Purged**	1.452946	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:40	0	0	100	65.12	0.00	0	0	0	0	0	0	Gray	None
08:45	5	5	100	65.43	0.13	7.3	2.19	811	12.52	6	87.6	Gray	None
08:50	5	10	100	65.43	0.26	7.37	2.2	761	12.02	6.1	81.6	Gray	None
08:55	5	15	100	65.43	0.40	7.42	2.2	541	11.58	6.3	77.9	Gray	None
09:00	5	20	100	65.43	0.53	7.44	2.2	498	11.24	6.5	76.9	Gray	None
09:05	5	25	100	65.43	0.66	7.46	2.2	456	10.82	6.4	76.1	Gray	None
09:10	5	30	100	65.43	0.79	7.47	2.2	402	10.7	6.6	76	Gray	None
09:15	5	35	100	65.43	0.92	7.49	2.22	354	10.96	6	76.1	Gray	None
09:20	5	40	100	65.43	1.06	7.5	2.17	310	10.42	6.6	75.6	Gray	None
09:25	5	45	100	65.43	1.19	7.49	2.21	285	10.47	6.6	75.9	Gray	None
09:30	5	50	100	65.43	1.32	7.49	2.21	270	10.48	6.5	75.9	Gray	None
09:35	5	55	100	65.43	1.45	7.49	2.21	266	10.5	6.4	75.8	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-122			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.41	**Total Depth (ft-bmp)**	66.85	**Water Column (ft)**	4.44	**Gallons in Well**	0.72
Purge Start	10:05	**Pump Intake (ft-bmp)**	65.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:05	**Volumes Purged**	2.20	**Sample ID**	MW-19-122_021623	**Sampled by**	Billy Cobern
Sample Time	11:05	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	100	62.41	0.00	0	0	0	0	0	0	Gray	None
10:10	5	5	100	62.73	0.13	7.27	2.57	961	9.7	7.2	91.7	Gray	None
10:15	5	10	100	62.73	0.26	7.23	3.42	878	8.71	8.6	88.1	Gray	None
10:20	5	15	100	62.73	0.40	7.2	3.39	749	9.4	10.6	87	Gray	None
10:25	5	20	100	62.73	0.53	7.21	3.5	703	11.06	7.5	87.3	Gray	None
10:30	5	25	100	62.73	0.66	7.25	3.45	634	11.03	5.2	85.7	Gray	None
10:35	5	30	100	62.73	0.79	7.26	3.44	572	10.9	5	85	Gray	None
10:40	5	35	100	62.73	0.92	7.24	3.35	471	9.42	8.1	83.6	Gray	None
10:45	5	40	100	62.73	1.06	7.23	3.39	426	9.59	8.5	83.1	Gray	None
10:50	5	45	100	62.73	1.19	7.24	3.41	397	9.48	8.9	81.9	Gray	None
10:55	5	50	100	62.73	1.32	7.23	3.4	345	9.4	8.9	80.5	Gray	None
11:00	5	55	100	62.73	1.45	7.22	3.42	266	9.44	9	80.3	Gray	None
11:05	5	60	100	62.73	1.59	7.22	3.42	294	9.46	8.9	80.2	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Turbidity didn't stabilize

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-123			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing N/NE at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.05	**Total Depth (ft-bmp)**	73.82	**Water Column (ft)**	9.77	**Gallons in Well**	1.59
Purge Start	12:25	**Pump Intake (ft-bmp)**	71.32	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:00	**Volumes Purged**	1.16	**Sample ID**	MW-19-123_021623	**Sampled by**	Austin Westhuis
Sample Time	12:55	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	200	64.05	0.26	6.92	2.391	26.7	6.89	12	-12.4	Clear	None
12:35	5	5	200	64.38	0.53	6.96	2.373	11.2	6.96	12.1	-22	Clear	None
12:40	5	10	200	67.70	0.79	6.95	2.392	5.08	7.01	11.9	-30.5	Clear	None
12:45	5	15	200	68.58	1.06	6.94	2.404	3.41	6.49	11.4	-38.8	Clear	None
12:50	5	20	200	69.02	1.32	6.94	2.401	3.02	6.44	11.5	-39.6	Clear	None
12:55	5	25	200	69.22	1.59	6.93	2.421	2.83	6.54	11.5	-42.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-126			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.76	**Total Depth (ft-bmp)**	76.41	**Water Column (ft)**	12.65	**Gallons in Well**	2.06
Purge Start	10:20	**Pump Intake (ft-bmp)**	73	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:20	**Volumes Purged**	1.41	**Sample ID**	MW-20-126_021623	**Sampled by**	Donald Richmond
Sample Time	11:20	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	200	63.76	1.06	6.86	2.69	143	11.03	7.8	134	Clear	None
10:45	5	5	200	63.76	1.32	6.87	2.62	97.1	11	7.4	124.8	Clear	None
10:50	5	10	200	63.76	1.59	6.87	2.66	81.3	10.9	7.4	121.4	Clear	None
10:55	5	15	200	63.76	1.85	6.88	2.61	81.3	11.18	6.8	117.6	Clear	None
11:00	5	20	200	63.76	2.11	6.89	2.6	49.1	10.89	7.4	114.2	Clear	None
11:05	5	25	200	63.76	2.38	6.89	2.4	46.2	10.94	7	111.5	Clear	None
11:10	5	30	200	63.76	2.64	6.89	2.26	36.2	11.13	6.6	109.9	Clear	None
11:15	5	35	200	63.76	2.91	6.9	2.6	30.8	10.89	6.9	107.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-127			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.95	**Total Depth (ft-bmp)**	78.67	**Water Column (ft)**	13.72	**Gallons in Well**	2.23
Purge Start	14:55	**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:40	**Volumes Purged**	0.95	**Sample ID**	MW-20-127_021623	**Sampled by**	Donald Richmond
Sample Time	15:40	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	200	64.95	0.53	7.03	2.25	1.93	2.01	9.7	86.3	Clear	None
15:10	5	5	200	64.95	0.79	6.85	2.27	2.89	0.94	9	59.7	Clear	None
15:15	5	10	200	64.95	1.06	6.86	2.26	2.58	0.74	8.3	50.8	Clear	None
15:20	5	15	200	64.95	1.32	6.83	2.26	2.58	0.61	8.4	46.5	Clear	None
15:25	5	20	200	64.95	1.59	6.83	2.27	0.02	0.43	8.5	34.9	Clear	None
15:30	5	25	200	64.95	1.85	6.83	2.29	0.02	0.39	8.7	30.2	Clear	None
15:35	5	30	200	64.95	2.11	6.83	2.27	0.02	0.4	8.5	27	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-129			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing NE at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.39	**Total Depth (ft-bmp)**	70.95	**Water Column (ft)**	10.56	**Gallons in Well**	1.72
Purge Start	11:30	**Pump Intake (ft-bmp)**	68.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:10	**Volumes Purged**	0.61	**Sample ID**	MW-20-129_021623	**Sampled by**	Billy Cobern
Sample Time	12:10	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	100	60.39	0.00	0	0	0	0	0	0	Gray	None
11:35	5	5	100	60.90	0.13	7.12	1.91	367	8.95	6.8	61.1	Gray	None
11:40	5	10	100	61.43	0.26	6.95	2.53	193	1.06	7.1	13.7	Gray	None
11:45	5	15	100	61.90	0.40	6.95	2.53	164	0.92	7.1	11.9	Gray	None
11:50	5	20	100	62.32	0.53	6.95	2.51	154	1	7.3	0.9	Gray	None
11:55	5	25	100	62.69	0.66	6.95	2.46	146	0.77	7	-9.6	Gray	None
12:00	5	30	100	62.99	0.08	6.96	2.42	140	0.81	6.8	-15.9	Gray	None
12:05	5	35	100	63.25	0.92	6.96	2.41	141	0.75	6.9	-18.7	Gray	None
12:10	5	40	100	63.53	1.06	6.96	2.4	136	0.79	6.9	-19.8	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-131			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.12	**Total Depth (ft-bmp)**	8.65	**Water Column (ft)**	3.53	**Gallons in Well**	0.57
Purge Start	15:45	**Pump Intake (ft-bmp)**	8	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:20	**Volumes Purged**	1.62	**Sample ID**	MW-20-131_021423	**Sampled by**	Billy Cobern
Sample Time	16:20	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	DUP-06_021423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:45	0	0	100	5.12	0.00	0	0	0	0	0	0	Clear	None
15:50	5	5	100	5.41	0.13	7.13	4.8	22.2	0.93	9.2	-7.6	Clear	None
15:55	5	10	100	5.41	0.26	7.12	4.79	17.4	0.31	9.2	-6.6	Clear	None
16:00	5	15	100	5.41	0.40	7.12	4.79	13.7	0.31	9.1	-6.3	Clear	None
16:05	5	20	100	5.41	0.53	7.12	4.8	10.2	0.23	9.1	-5.8	Clear	None
16:10	5	25	100	5.41	0.66	7.11	4.8	9.84	0.22	9.1	-5.5	Clear	None
16:15	5	30	100	5.41	0.79	7.11	4.8	9.36	0.21	9.2	-5.4	Clear	None
16:20	5	35	100	5.41	0.92	7.11	4.8	9.14	0.22	9.3	-5.2	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-132			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	57.0 degrees F and Clear. The wind is blowing S at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.17	**Total Depth (ft-bmp)**	10.7	**Water Column (ft)**	5.53	**Gallons in Well**	0.90
Purge Start	14:40	**Pump Intake (ft-bmp)**	8.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:20	**Volumes Purged**	1.17	**Sample ID**	MW-20-132_021423	**Sampled by**	Billy Cobern
Sample Time	15:20	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:40	0	0	100	5.17	0.00	0	0	0	0	0	0	Clear	None
14:45	5	5	100	5.47	0.13	7.03	5.84	60.7	1.39	10.6	14.8	Clear	None
14:50	5	10	100	5.44	0.26	7.07	5.85	53.8	0.92	10.3	-1.2	Clear	None
14:55	5	15	100	5.44	0.40	7.08	5.85	47.7	0.57	10.3	-15	Clear	None
15:00	5	20	100	5.44	0.53	7.1	5.86	36.2	0.3	10.1	-22.9	Clear	None
15:05	5	25	100	5.44	0.66	7.1	5.86	20.5	0.25	10	-28.3	Clear	None
15:10	5	30	100	5.44	0.79	7.1	5.87	16.7	0.23	10	-33.5	Clear	None
15:15	5	35	100	5.44	0.92	7.1	5.87	15.9	0.24	10	-35.2	Clear	None
15:20	5	40	100	5.44	1.06	7.1	5.87	15.8	0.24	10	-36.9	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-139			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.39	**Total Depth (ft-bmp)**	15.35	**Water Column (ft)**	12.96	**Gallons in Well**	2.11
Purge Start	15:20	**Pump Intake (ft-bmp)**	12.85	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:00	**Volumes Purged**	1.00	**Sample ID**	MW-21-139_021523	**Sampled by**	Austin Westhuis
Sample Time	15:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:25	0	0	200	2.39	0.26	7.91	1.715	3.68	0.17	7.9	-98.7	Clear	None
15:30	5	5	200	2.39	0.53	7.86	1.689	2.75	0.09	7.7	-129.9	Clear	None
15:35	5	10	200	2.39	0.79	7.86	1.647	2.11	0.07	7.9	-148.6	Clear	None
15:40	5	15	200	2.39	1.06	7.76	1.598	1.91	0.07	7.7	-151.7	Clear	None
15:45	5	20	200	2.39	1.32	7.69	1.55	1.6	0.07	7.7	-158.5	Clear	None
15:50	5	25	200	2.39	1.59	7.63	1.542	1.43	0.07	7.7	-166.8	Clear	None
15:55	5	30	200	2.39	1.85	7.63	1.536	1.22	0.07	7.7	-168	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-140			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	34.0 degrees F and Cloudy. The wind is blowing NE at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.45	**Total Depth (ft-bmp)**	75.97	**Water Column (ft)**	7.52	**Gallons in Well**	1.22
Purge Start	08:40	**Pump Intake (ft-bmp)**	73.47	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**	3.03	**Sample ID**	MW-21-140_021623	**Sampled by**	Austin Westhuis
Sample Time	09:20	**Gallons Purged**	3.6984087	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:45	0	0	200	68.62	0.26	6.85	0.817	225	0.46	11.9	-45.8	Clear	None
08:50	5	5	200	68.65	0.53	6.91	0.82	106	0.34	12.1	-71	Clear	None
08:55	5	10	200	68.65	0.79	6.93	0.817	44.6	0.3	12.1	-89.4	Clear	None
09:00	5	15	200	68.65	1.06	6.94	0.818	21.5	0.28	11.7	-103.3	Clear	None
09:05	5	20	200	68.65	1.32	6.94	0.816	11.4	0.26	11.9	-111.9	Clear	None
09:10	5	25	200	68.65	1.59	6.95	0.816	7.31	0.25	12	-117.3	Clear	None
09:15	5	30	200	68.65	1.85	6.95	0.82	6.95	0.26	12	-121.1	Clear	None
09:20	5	35	200	68.65	2.11	6.95	0.815	6.41	0.25	12	-127.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	9	HCL
PFAS	250mL HDPE Plastic	6	None
SVOCs	1L Amber	6	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 10G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-143			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	44.1 degrees F and Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.02	**Total Depth (ft-bmp)**	31.02	**Water Column (ft)**	13.00	**Gallons in Well**	2.11
Purge Start	12:30	**Pump Intake (ft-bmp)**	29.02	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:10	**Volumes Purged**	1.00	**Sample ID**	MW-22-143_021323	**Sampled by**	Austin Westhuis
Sample Time	13:05	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:35	0	0	200	18.07	0.26	6.87	3.176	13.3	0.27	12.4	8.2	Clear	None
12:40	5	5	200	18.07	0.53	6.89	3.176	6.31	0.24	12.2	-26.4	Clear	None
12:45	5	10	200	18.07	0.79	6.92	3.16	4.11	0.26	12.4	-63.9	Clear	None
12:50	5	15	200	18.07	1.06	6.95	3.171	3.81	0.35	12.5	-81.1	Clear	None
12:55	5	20	200	18.07	1.32	6.95	3.17	3.64	0.32	12.6	-90.3	Clear	None
13:00	5	25	200	18.07	1.59	6.96	3.178	3.46	0.31	12.4	-95.9	Clear	None
13:05	5	30	200	18.07	1.85	6.97	3.191	3.22	0.3	12.6	-98.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well locked with Arcadis 2035 Master Lock.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-144			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Mostly Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.72	**Total Depth (ft-bmp)**	24.08	**Water Column (ft)**	10.36	**Gallons in Well**	1.68
Purge Start	13:45	**Pump Intake (ft-bmp)**	22.08	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:15	**Volumes Purged**	0.94	**Sample ID**	MW-22-144_021323	**Sampled by**	Austin Westhuis
Sample Time	14:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	200	13.92	0.26	6.92	1.25	14.6	0.49	11.9	-110.7	Clear	None
13:55	5	5	200	13.94	0.53	6.92	1.264	4.81	0.47	11.7	-115.1	Clear	None
14:00	5	10	200	13.94	0.79	6.93	1.27	3.27	0.48	11.7	-122.8	Clear	None
14:05	5	15	200	13.94	1.06	6.94	1.272	3.12	0.47	11.6	-129.3	Clear	None
14:10	5	20	200	13.94	1.32	6.94	1.274	2.95	0.48	11.7	-132.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well locked with Arcadis 2035 Master Lock.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-145			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Clear. The wind is blowing W/NW at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.75	**Total Depth (ft-bmp)**	14.95	**Water Column (ft)**	1.20	**Gallons in Well**	0.19
Purge Start	14:25	**Pump Intake (ft-bmp)**	13.95	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:55	**Volumes Purged**	8.34	**Sample ID**	MW-22-145_021323	**Sampled by**	Austin Westhuis
Sample Time	14:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	200	13.77	0.26	6.98	1.052	7.43	3.76	10.5	-103.9	Clear	None
14:35	5	5	200	13.77	0.53	6.98	1.073	3.05	3.5	10.5	-106	Clear	None
14:40	5	10	200	13.77	0.79	6.98	1.102	2.58	3.31	10.5	-108.6	Clear	None
14:45	5	15	200	13.77	1.06	6.97	1.119	2.19	3.28	10.5	-110.7	Clear	None
14:50	5	20	200	13.77	1.32	6.98	1.128	1.89	3.22	10.6	-110.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well locked with Arcadis 2035 Master Lock.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-146			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Clear. The wind is blowing W/NW at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.05	**Total Depth (ft-bmp)**	9.89	**Water Column (ft)**	3.84	**Gallons in Well**	0.62
Purge Start	15:10	**Pump Intake (ft-bmp)**	8.39	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:45	**Volumes Purged**	2.98	**Sample ID**	MW-22-146_021323	**Sampled by**	Austin Westhuis
Sample Time	15:40	**Gallons Purged**	1.849204	**Replicate/ Code No.**	DUP-07_021323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:15	0	0	200	6.08	0.26	7.18	1.014	21.6	4.85	8.5	-72.9	Clear	None
15:20	5	5	200	6.08	0.53	7.19	1.013	11.2	5.45	8.4	-72	Clear	None
15:25	5	10	200	6.08	0.79	7.2	1	5.68	6.32	8.4	-72.9	Clear	None
15:30	5	15	200	6.08	1.06	7.21	0.995	3.13	6.45	8.4	-71	Clear	None
15:35	5	20	200	6.08	1.32	7.21	0.991	2.65	6.79	8.4	-68.8	Clear	None
15:40	5	25	200	6.08	1.59	7.2	0.993	2.14	6.93	8.4	-66.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments: Well locked with Arcadis 2035 Master Lock.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-147			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	54.0 degrees F and Clear. The wind is blowing S/SE at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.38	**Total Depth (ft-bmp)**	12.2	**Water Column (ft)**	2.82	**Gallons in Well**	0.46
Purge Start	13:30	**Pump Intake (ft-bmp)**	11.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:15	**Volumes Purged**	2.58	**Sample ID**	MW-22-147_021423	**Sampled by**	Billy Cobern
Sample Time	14:15	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	100	9.38	0.00	0	0	0	0	0	0	Clear	None
13:35	5	5	100	9.62	0.13	7.33	1.65	43.9	1.07	10.6	9.7	Clear	None
13:40	5	10	100	9.68	0.26	7.34	1.65	78.3	10.4	10.4	5.5	Clear	None
13:45	5	15	100	9.69	0.40	7.35	1.65	101	0.89	10.4	3.8	Clear	None
13:50	5	20	100	9.69	0.53	7.35	1.65	68.9	0.83	10.4	2.1	Clear	None
13:55	5	25	100	9.69	0.66	7.34	1.65	44.3	1.26	10.3	0.1	Clear	None
14:00	5	30	100	9.69	0.79	7.33	1.66	38.3	1.56	10.3	-0.4	Clear	None
14:05	5	35	100	9.69	0.92	7.31	1.66	33.8	1.65	10.2	-0.9	Clear	None
14:10	5	40	100	9.69	1.06	7.29	1.66	31.3	1.67	10.3	-1.9	Clear	None
14:15	5	45	100	9.69	1.19	7.28	1.66	32	1.65	10.3	-2.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-148			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	It is Clear. The wind is blowing S at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.42	**Total Depth (ft-bmp)**	29.3	**Water Column (ft)**	3.88	**Gallons in Well**	0.63
Purge Start	12:00	**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:55	**Volumes Purged**	2.31	**Sample ID**	MW-22-148_021423	**Sampled by**	Billy Cobern
Sample Time	12:55	**Gallons Purged**	1.452946	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	100	25.42	0.00	0	0	0	0	0	0	Clear	None
12:05	5	5	100	25.85	0.13	7.14	0.92	358	0.7	12.6	14.7	Clear	None
12:10	5	10	100	26.00	0.26	7.18	0.91	156	0.61	12.7	7	Clear	None
12:15	5	15	100	26.11	0.40	7.22	0.89	85.4	0.47	12.5	3.1	Clear	None
12:20	5	20	100	26.22	0.53	7.24	0.89	77.3	0.43	12	3	Clear	None
12:25	5	25	100	26.31	0.66	7.26	0.89	68.4	0.56	11.9	4.2	Clear	None
12:30	5	30	100	26.41	0.79	7.25	0.89	41.7	0.49	12.1	4.8	Clear	None
12:35	5	35	100	26.51	0.92	7.25	0.89	20.7	0.51	11.9	5.5	Clear	None
12:40	5	40	100	26.60	1.06	7.25	0.89	14.8	0.44	12	5.9	Clear	None
12:45	5	45	100	26.69	1.19	7.25	0.89	11.4	0.38	12.1	6.1	Clear	None
12:50	5	50	100	26.78	1.32	7.25	0.89	11.1	0.39	12.1	6.2	Clear	None
12:55	5	55	100	26.86	1.45	7.25	0.89	11	0.4	12.2	6.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	6	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-149			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	45.0 degrees F and Clear. The wind is blowing W at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.85	**Total Depth (ft-bmp)**	9.9	**Water Column (ft)**	5.05	**Gallons in Well**	0.82
Purge Start	16:20	**Pump Intake (ft-bmp)**	7.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:55	**Volumes Purged**	1.13	**Sample ID**	MW-22-149_021323	**Sampled by**	Billy Cobern
Sample Time	16:55	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:20	0	0	100	4.85	0.00	0	0	0	0	0	0	Clear	None
16:25	5	5	100	5.33	0.13	7.5	0.582	16.1	6.21	8.2	-34.1	Clear	None
16:30	5	10	100	5.29	0.26	7.47	0.571	10	6.51	7.9	-24.1	Clear	None
16:35	5	15	100	5.23	0.40	7.46	0.57	9.93	6.59	7.8	-16.2	Clear	None
16:40	5	20	100	5.13	0.53	7.45	0.57	8.96	6.73	7.7	-6.8	Clear	None
16:45	5	25	100	5.13	0.66	7.45	0.569	7.93	6.91	7.6	-0.8	Clear	None
16:50	5	30	100	5.13	0.79	7.46	0.569	8.05	6.86	7.6	-0.1	Clear	None
16:55	5	35	100	5.13	0.92	7.45	0.569	7.84	6.87	7.6	0.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-150			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Clear. The wind is blowing W at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.39	**Total Depth (ft-bmp)**	17.95	**Water Column (ft)**	12.56	**Gallons in Well**	2.04
Purge Start	15:25	**Pump Intake (ft-bmp)**	15.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:55	**Volumes Purged**	0.39	**Sample ID**	MW-22-150_021323	**Sampled by**	Billy Cobern
Sample Time	15:55	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:25	0	0	100	5.39	0.00	0	0	0	0	0	0	Clear	None
15:30	5	5	100	5.73	0.13	7.37	4.76	14.2	0.56	9.7	32.8	Clear	None
15:35	5	10	100	5.95	0.26	7.37	4.79	9.32	0.49	9.5	32.5	Clear	None
15:40	5	15	100	6.17	0.40	7.37	4.78	9.45	0.34	9.6	32.2	Clear	None
15:45	5	20	100	6.34	0.53	7.37	4.79	9.59	0.34	9.2	32.2	Clear	None
15:50	5	25	100	6.49	0.66	7.37	4.79	9.42	0.36	9.3	32.1	Clear	None
15:55	5	30	100	6.64	0.79	7.37	4.79	9.23	0.36	9.3	32	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-151			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Clear. The wind is blowing W/NW at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.98	**Total Depth (ft-bmp)**	14.95	**Water Column (ft)**	8.97	**Gallons in Well**	1.46
Purge Start	14:20	**Pump Intake (ft-bmp)**	12.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:05	**Volumes Purged**	0.81	**Sample ID**	MW-22-151_021323	**Sampled by**	Billy Cobern
Sample Time	15:05	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:20	0	0	100	5.98	0.00	0	0	0	0	0	0	Clear	None
14:25	5	5	100	6.23	0.13	6.86	2.66	67.7	0.56	11.4	14.8	Clear	None
14:30	5	10	100	6.29	0.26	6.88	2.66	54.8	0.42	11.1	7.3	Clear	None
14:35	5	15	100	6.29	0.40	6.89	2.67	50.3	0.32	10.9	-1.5	Clear	None
14:40	5	20	100	6.29	0.53	6.88	2.67	47.7	0.32	10.9	-5.3	Clear	None
14:45	5	25	100	6.29	0.66	6.89	2.67	42	0.35	10.9	-10.5	Clear	None
14:50	5	30	100	6.29	0.79	6.89	2.67	40.2	0.33	10.9	-13.3	Clear	None
14:55	5	35	100	6.29	0.92	6.89	2.67	37.9	0.42	11	-18.6	Clear	None
15:00	5	40	100	6.29	1.06	6.89	2.67	38.3	0.41	11	-20.9	Clear	None
15:05	5	45	100	6.29	1.19	6.89	2.67	35.8	0.4	11	-21.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-152			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.0 degrees F and Mostly Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.21	**Total Depth (ft-bmp)**	14.9	**Water Column (ft)**	7.69	**Gallons in Well**	1.25
Purge Start	13:15	**Pump Intake (ft-bmp)**	12.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:55	**Volumes Purged**	0.85	**Sample ID**	MW-22-152_021323	**Sampled by**	Billy Cobern
Sample Time	13:55	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	100	7.21	0.00	0	0	0	0	0	0	Clear	None
13:20	5	5	100	7.29	0.13	7.05	1.25	18.6	0.27	10.9	-20.5	Clear	None
13:25	5	10	100	7.29	0.26	7.03	1.24	15.7	0.19	11	-18.2	Clear	None
13:30	5	15	100	7.29	0.40	7.03	1.24	12.4	0.18	11	-17.6	Clear	None
13:35	5	20	100	7.29	0.53	7.02	1.24	9.78	0.15	11.1	-11.1	Clear	None
13:40	5	25	100	7.29	0.66	7.02	1.25	8.86	0.14	11.2	-15.7	Clear	None
13:45	5	30	100	7.29	0.79	7.02	1.25	7.67	0.14	11.1	-15.2	Clear	None
13:50	5	35	100	7.29	0.92	7.01	1.25	7.52	0.15	11.2	-14.5	Clear	None
13:55	5	40	100	7.29	1.06	7.01	1.25	7.34	0.15	11.2	-13.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-153			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.61	**Total Depth (ft-bmp)**	31.18	**Water Column (ft)**	20.57	**Gallons in Well**	3.34
Purge Start	10:30	**Pump Intake (ft-bmp)**	28.68	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:15	**Volumes Purged**	0.71	**Sample ID**	MW-22-153_021523	**Sampled by**	Austin Westhuis
Sample Time	11:10	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	200	10.61	0.26	6.83	2.735	15.4	0.35	12.6	-118	Clear	None
10:40	5	5	200	10.61	0.53	6.88	2.621	8.83	0.17	12.7	-133.3	Clear	None
10:45	5	10	200	10.61	0.79	6.93	2.417	3.35	0.12	12.7	-149.4	Clear	None
10:50	5	15	200	10.61	1.06	6.94	2.383	3.02	0.11	12.7	-158.6	Clear	None
10:55	5	20	200	10.61	1.32	6.95	2.353	1.81	0.1	12.8	-167.3	Clear	None
11:00	5	25	200	10.61	1.59	6.96	2.33	1.5	0.11	12.8	-173.9	Clear	None
11:05	5	30	200	10.61	1.85	6.96	2.308	1.23	0.12	12.8	-175.9	Clear	None
11:10	5	35	200	10.61	2.11	6.98	2.264	1.09	0.12	12.9	-181.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-154			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	44.1 degrees F and Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.26	**Total Depth (ft-bmp)**	10.55	**Water Column (ft)**	5.29	**Gallons in Well**	0.86
Purge Start	12:30	**Pump Intake (ft-bmp)**	8.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:55	**Volumes Purged**	0.77	**Sample ID**	MW-22-154_021323	**Sampled by**	Billy Cobern
Sample Time	12:55	**Gallons Purged**	0.6604301	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	5.26	0.00	0	0	0	0	0	0	Clear	None
12:35	5	5	100	5.39	0.13	6.92	5.34	10.8	0.54	9.9	3.1	Clear	None
12:40	5	10	100	5.41	0.26	6.94	5.32	8.97	0.52	9.8	-0.2	Clear	None
12:45	5	15	100	5.41	0.40	6.95	5.34	8.23	0.46	9.8	-1.7	Clear	None
12:50	5	20	100	5.41	0.53	6.95	5.37	8.05	0.45	9.8	-3.4	Clear	None
12:55	5	25	100	5.41	0.66	6.95	5.37	7.88	0.44	9.8	-3.7	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-155			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.89	**Total Depth (ft-bmp)**	31.43	**Water Column (ft)**	19.54	**Gallons in Well**	3.18
Purge Start	11:35	**Pump Intake (ft-bmp)**	28.93	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:25	**Volumes Purged**	0.83	**Sample ID**	MW-22-155_021523	**Sampled by**	Austin Westhuis
Sample Time	12:20	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:40	0	0	200	11.89	0.26	6.97	1.925	576	1.38	11.8	-143.5	Clear	None
11:45	5	5	200	11.89	0.53	6.96	1.942	223	1.26	12	-159.7	Clear	None
11:50	5	10	200	11.89	0.79	6.98	1.968	108	1.26	11.9	-168.7	Clear	None
11:55	5	15	200	11.89	1.06	6.98	1.972	44.8	1.25	11.8	-171.9	Clear	None
12:00	5	20	200	11.89	1.32	6.98	1.989	19.5	1.22	12.1	-173.8	Clear	None
12:05	5	25	200	11.89	1.59	6.98	2.007	8.93	1.1	11.7	-177.3	Clear	None
12:10	5	30	200	11.89	1.85	6.98	2.001	6.55	0.94	11.8	-179.3	Clear	None
12:15	5	35	200	11.89	2.11	6.98	2.015	6.03	0.89	12	-180.5	Clear	None
12:20	5	40	200	11.89	2.38	6.99	2.02	5.79	0.86	12	-182.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-156			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	53.1 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.06	**Total Depth (ft-bmp)**	31.06	**Water Column (ft)**	18.00	**Gallons in Well**	2.92
Purge Start	09:35	**Pump Intake (ft-bmp)**	28.56	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:20	**Volumes Purged**	0.81	**Sample ID**	MW-22-156_021523	**Sampled by**	Austin Westhuis
Sample Time	10:15	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:40	0	0	200	13.12	0.26	7.07	1.368	3.11	3.9	12.8	5.7	Clear	None
09:45	5	5	200	13.12	0.53	6.89	1.772	2.71	0.64	12.9	-89.9	Clear	None
09:50	5	10	200	13.12	0.79	6.9	1.828	2.14	0.54	13	-108.9	Clear	None
09:55	5	15	200	13.12	1.06	6.95	1.913	1.69	0.43	13	-143.7	Clear	None
10:00	5	20	200	13.12	1.32	6.98	1.927	1.6	0.61	13.1	-154.6	Clear	None
10:05	5	25	200	13.12	1.59	7	1.953	1.45	0.61	13.2	-164.8	Clear	None
10:10	5	30	200	13.12	1.85	7.01	1.961	1.33	0.59	13.2	-166.7	Clear	None
10:15	5	35	200	13.12	2.11	7.02	1.968	1.12	0.57	13.1	-170.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-157			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	48.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.63	**Total Depth (ft-bmp)**	27.61	**Water Column (ft)**	24.98	**Gallons in Well**	4.06
Purge Start	14:00	**Pump Intake (ft-bmp)**	25.11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:35	**Volumes Purged**	0.46	**Sample ID**	MW-22-157_021523	**Sampled by**	Austin Westhuis
Sample Time	14:30	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:05	0	0	200	2.63	0.26	6.95	1.948	2.96	0.19	12.7	-105.5	Clear	None
14:10	5	5	200	2.63	0.53	6.98	1.96	2.44	0.15	12.8	-126.7	Clear	None
14:15	5	10	200	2.63	0.79	7	1.968	2.34	0.11	12.9	-140.6	Clear	None
14:20	5	15	200	2.63	1.06	7.01	1.974	2.08	0.12	12.9	-150.9	Clear	None
14:25	5	20	200	2.63	1.32	7.01	1.977	1.68	0.11	12.9	-155.6	Clear	None
14:30	5	25	200	2.63	1.59	7.01	1.986	1.61	0.11	13	-157.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-158			**Date**	2/13/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	45.0 degrees F and Clear. The wind is blowing W at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	15.65	**Total Depth (ft-bmp)**	20.15	**Water Column (ft)**	4.50	**Gallons in Well**	0.73
Purge Start	16:15	**Pump Intake (ft-bmp)**	17.65	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:45	**Volumes Purged**	2.17	**Sample ID**	MW-22-158_021323	**Sampled by**	Austin Westhuis
Sample Time	16:40	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:20	0	0	200	15.65	0.26	7.06	3.467	4.38	0.33	11.6	-70.1	Clear	None
16:25	5	5	200	15.65	0.53	7.1	3.572	2.11	0.16	11.4	-92	Clear	None
16:30	5	10	200	15.65	0.79	7.1	3.587	1.93	0.15	11.3	-94.8	Clear	None
16:35	5	15	200	15.65	1.06	7.09	3.605	1.67	0.15	11.4	-95.1	Clear	None
16:40	5	20	200	15.65	1.32	7.09	3.614	1.6	0.16	11.4	-97.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-160			**Date**	2/14/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	54.0 degrees F and Clear. The wind is blowing S/SE at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	15.19	**Total Depth (ft-bmp)**	18.15	**Water Column (ft)**	2.96	**Gallons in Well**	0.48
Purge Start	13:25	**Pump Intake (ft-bmp)**	17.15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:05	**Volumes Purged**	4.40	**Sample ID**	MW-22-160_021423	**Sampled by**	Austin Westhuis
Sample Time	14:00	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	200	15.19	0.26	6.74	1.123	109	0.47	12.3	-116.6	Clear	None
13:35	5	5	200	15.19	0.53	6.76	1.127	41.7	0.87	12.3	-148.9	Clear	None
13:40	5	10	200	15.19	0.79	6.78	1.127	11.65	0.84	12.3	-156.4	Clear	None
13:45	5	15	200	15.19	1.06	6.81	1.125	3.88	0.79	12.3	-159	Clear	None
13:50	5	20	200	15.19	1.32	6.81	1.125	3.08	0.78	12.2	-159.9	Clear	None
13:55	5	25	200	15.19	1.59	6.81	1.125	2.79	0.77	12.2	-161.3	Clear	None
14:00	5	30	200	15.19	1.85	6.82	1.124	2.54	0.75	12.2	-167.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.

Well Locked at Arrival: no

Condition of Well: Good condition

Well Locked at Departure: no

Well Completion: Flush mount

Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	P6-SB-07			**Date**	2/15/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.52	**Total Depth (ft-bmp)**	23.6	**Water Column (ft)**	18.08	**Gallons in Well**	2.94
Purge Start	10:15	**Pump Intake (ft-bmp)**	21	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:55	**Volumes Purged**	0.36	**Sample ID**	P6-SB-07_021523	**Sampled by**	Billy Cobern
Sample Time	10:55	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:15	0	0	100	5.52	0.00	0	0	0	0	0	0	Clear	None
10:20	5	5	100	5.63	0.13	7.27	0.73	18.3	4.95	9.7	63.5	Clear	None
10:25	5	10	100	5.63	0.26	7.51	0.689	18.1	4.24	9.6	54	Clear	None
10:30	5	15	100	5.63	0.40	7.67	0.618	15.4	3.69	9.5	45.5	Clear	None
10:35	5	20	100	5.63	0.53	7.7	0.576	13.2	3.17	9.6	40.3	Clear	None
10:40	5	25	100	5.63	0.66	7.68	0.574	11.7	2.94	9.5	36.1	Clear	None
10:45	5	30	100	5.63	0.79	7.68	0.567	10.1	2.39	9.5	29.4	Clear	None
10:50	5	35	100	5.63	0.92	7.67	0.567	9.92	2.38	9.5	26	Clear	None
10:55	5	40	100	5.63	1.06	7.67	0.566	9.82	2.41	9.5	23.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-02			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.75	**Total Depth (ft-bmp)**	85.2	**Water Column (ft)**	20.45	**Gallons in Well**	29.91
Purge Start	13:35	**Pump Intake (ft-bmp)**	82.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:10	**Volumes Purged**	0.05	**Sample ID**	PW-14-02_021623	**Sampled by**	Donald Richmond
Sample Time	14:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:45	0	0	200	64.75	0.53	7.38	1.6	20.1	8.34	8.9	99.5	Clear	None
13:50	5	5	200	64.75	0.79	7.35	1.61	12.4	8.49	9.2	95.3	Clear	None
13:55	5	10	200	64.75	1.06	7.38	1.59	7.94	8.88	8.6	94.3	Clear	None
14:00	5	15	200	64.75	1.32	7.37	1.59	6.93	9.2	8.6	95.3	Clear	None
14:05	5	20	200	64.75	1.59	7.39	1.54	5.3	9.42	7.8	95.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-03			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	17.1 degrees F and Clear. The wind is blowing N/NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	73.18	**Total Depth (ft-bmp)**	95.5	**Water Column (ft)**	22.32	**Gallons in Well**	32.64
Purge Start	08:35	**Pump Intake (ft-bmp)**	93	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:20	**Volumes Purged**	0.04	**Sample ID**	PW-14-03_021723	**Sampled by**	Billy Cobern
Sample Time	09:20	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:35	0	0	100	73.18	0.00	0	0	0	0	0	0	Clear	None
08:40	5	5	100	73.35	0.13	6.79	3.78	21.8	9.66	5.8	48.1	Clear	None
08:45	5	10	100	73.35	0.26	6.79	3.72	19.6	8.41	5.8	41.4	Clear	None
08:50	5	15	100	73.35	0.40	6.79	3.71	16.4	7.7	5.6	37.2	Clear	None
08:55	5	20	100	73.35	0.53	6.79	3.7	13.2	7.02	5.5	35.2	Clear	None
09:00	5	25	100	73.35	0.66	6.79	3.67	11.3	6.49	5.5	33.9	Clear	None
09:05	5	30	100	73.35	0.79	6.79	3.67	9.93	6.31	5.2	33.6	Clear	None
09:10	5	35	100	73.35	0.92	6.8	3.66	9.6	6.28	4.9	33.4	Clear	None
09:15	5	40	100	73.35	1.06	6.8	3.66	9.31	6.25	4.8	33.4	Clear	None
09:20	5	45	100	73.35	1.19	6.8	3.65	9.06	6.22	4.9	33.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-02			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	30.9 degrees F and Cloudy. The wind is blowing NE at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.76	**Total Depth (ft-bmp)**	70.51	**Water Column (ft)**	9.75	**Gallons in Well**	1.58
Purge Start	12:40	**Pump Intake (ft-bmp)**	68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:35	**Volumes Purged**	0.92	**Sample ID**	TW-14-02_021623	**Sampled by**	Billy Cobern
Sample Time	13:35	**Gallons Purged**	1.452946	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:40	0	0	100	60.76	0.00	0	0	0	0	0	0	Gray	None
12:45	5	5	100	61.05	0.13	7.66	2.38	45.3	13.96	2.9	18.4	Gray	None
12:50	5	10	100	61.05	0.26	7.62	4.92	195	13.17	2.4	23.2	Gray	None
12:55	5	15	100	61.05	0.40	7.61	7.61	213	12.8	2.2	23.2	Gray	None
13:00	5	20	100	61.05	0.53	7.6	4.96	104	12.57	2.2	22.9	Gray	None
13:05	5	25	100	61.05	0.66	7.59	4.97	89.9	12.29	2.4	22.3	Gray	None
13:10	5	30	100	61.05	0.79	7.58	5.01	69.7	12.51	1.9	21.6	Gray	None
13:15	5	35	100	61.05	0.92	7.58	4.99	61.1	12.33	1.9	20.6	Gray	None
13:20	5	40	100	61.05	1.06	7.55	4.98	50.8	12.12	2.1	19.8	Gray	None
13:25	5	45	100	61.05	1.19	7.52	4.98	43.7	12.09	2.3	19.8	Gray	None
13:30	5	50	100	61.05	1.32	7.52	4.99	40.9	12.1	2.3	19.9	Gray	None
13:35	5	55	100	61.05	1.45	7.52	4.99	38.8	12.1	2.3	19.9	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-11			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	73.62	**Total Depth (ft-bmp)**	87.05	**Water Column (ft)**	13.43	**Gallons in Well**	2.18
Purge Start	11:25	**Pump Intake (ft-bmp)**	85.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:30	**Volumes Purged**	1.33	**Sample ID**	TW-15-11_021723	**Sampled by**	Donald Richmond
Sample Time	12:30	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	200	73.62	1.06	6.92	2.2	74.2	2.3	8.4	-6.1	Clear	None
11:50	5	5	200	73.62	1.32	6.88	2.19	66.8	1.73	7.9	-0.7	Clear	None
11:55	5	10	200	73.62	1.59	6.85	2.25	64.5	1.37	8.2	-1.4	Clear	None
12:00	5	15	200	73.62	1.85	6.8	2.27	42.2	0.68	8.9	-4.9	Clear	None
12:05	5	20	200	73.62	2.11	6.77	2.25	23.8	0.34	8.2	-6.1	Clear	None
12:10	5	25	200	73.62	2.38	6.76	2.31	15.9	0.36	8.3	-8.7	Clear	None
12:15	5	30	200	73.62	2.64	6.76	2.3	14.5	0.27	8.2	-9.6	Clear	None
12:20	5	35	200	73.62	2.91	6.76	2.32	13.4	0.29	8.4	-11.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-12			**Date**	2/16/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.33	**Total Depth (ft-bmp)**	78.3	**Water Column (ft)**	15.97	**Gallons in Well**	10.38
Purge Start	12:20	**Pump Intake (ft-bmp)**	74.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:05	**Volumes Purged**	0.20	**Sample ID**	TW-15-12_021623	**Sampled by**	Donald Richmond
Sample Time	13:05	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:35	0	0	200	62.33	0.79	7.69	1.76	394	10.76	9.6	109.5	Clear	None
12:40	5	5	200	62.33	1.06	7.67	1.82	138	11.18	9.9	103.8	Clear	None
12:45	5	10	200	62.33	1.32	7.64	1.82	87.3	10.64	9.8	105	Clear	None
12:50	5	15	200	62.33	1.59	7.61	1.82	77.2	11.06	9.8	106.3	Clear	None
12:55	5	20	200	62.33	1.85	7.58	1.82	76.2	10.85	10.2	107.9	Clear	None
13:00	5	25	200	62.33	2.11	7.59	1.82	79.7	10.73	10.1	107.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	UNK-15			**Date**	2/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	19 °F, Overcast, W winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.36	**Total Depth (ft-bmp)**	16	**Water Column (ft)**	15.64	**Gallons in Well**	10.17
Purge Start	10:50	**Pump Intake (ft-bmp)**	13.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:25	**Volumes Purged**	0.18	**Sample ID**	UNK-15_021723	**Sampled by**	Austin Westhuis
Sample Time	11:20	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:55	0	0	200	0.36	0.26	7.77	0.641	14.7	1.47	7.5	-112.8	Clear	None
11:00	5	5	200	0.36	0.53	7.78	0.643	5.09	1.38	7.6	-119.7	Clear	None
11:05	5	10	200	0.36	0.79	7.8	0.644	3.31	1.34	7.5	-133.9	Clear	None
11:10	5	15	200	0.36	1.06	7.82	0.645	2.46	1.32	7.7	-148.4	Clear	None
11:15	5	20	200	0.36	1.32	7.83	0.643	2.16	1.31	7.6	-151.1	Clear	None
11:20	5	25	200	0.36	1.59	7.83	0.645	1.71	1.32	7.6	-145.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A06			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	64.4 degrees F and Clear. The wind is blowing SW at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.04	**Total Depth (ft-bmp)**	92.6	**Water Column (ft)**	27.56	**Gallons in Well**	4.48
Purge Start	13:40	**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:20	**Volumes Purged**	0.24	**Sample ID**	AS-19-A06_051923	**Sampled by**	Billy Cobern
Sample Time	14:20	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:45	0	0	100	65.45	0.13	7.6	0.73	10.9	3.28	19.4	133.7	Clear	None
13:50	5	5	100	65.75	0.26	7.6	1.33	9.36	4.64	18.1	126.9	Clear	None
13:55	5	10	100	66.02	0.40	7.48	1.36	9.84	1.49	17.6	124	Clear	None
14:00	5	15	100	66.28	0.53	7.47	1.37	9.2	0.68	16.9	120.2	Clear	None
14:05	5	20	100	66.52	0.66	7.47	1.36	9.61	0.6	16.8	119	Clear	None
14:10	5	25	100	66.75	0.79	7.47	1.36	9.02	0.52	16.8	118.3	Clear	None
14:15	5	30	100	66.99	0.92	7.48	1.36	8.79	0.49	16.9	117.6	Clear	None
14:20	5	35	100	67.19	1.06	7.48	1.36	8.69	0.49	16.9	116.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A07			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	64.4 degrees F and Clear. The wind is blowing SW at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.09	**Total Depth (ft-bmp)**	91.2	**Water Column (ft)**	24.11	**Gallons in Well**	3.92
Purge Start	12:45	**Pump Intake (ft-bmp)**	88	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:10	**Volumes Purged**	0.17	**Sample ID**	AS-19-A07_051923	**Sampled by**	Billy Cobern
Sample Time	13:10	**Gallons Purged**	0.66	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	100	67.59	0.13	7.07	0.85	12.4	7.47	18.9	83.9	Clear	None
12:55	5	5	100	68.05	0.26	7.03	1.67	10.9	6.84	17.1	90.2	Clear	None
13:00	5	10	100	68.49	0.40	6.99	1.66	9.72	6.04	16.8	92.6	Clear	None
13:05	5	15	100	68.91	0.53	6.98	1.66	9.81	5.73	16.6	93.8	Clear	None
13:10	5	20	100	69.36	0.66	6.98	1.66	9.48	5.72	16.5	94.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-04-05(6)			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	78 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.21	**Total Depth (ft-bmp)**	29.61	**Water Column (ft)**	20.40	**Gallons in Well**	3.31
Purge Start	14:45	**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:20	**Volumes Purged**	0.60	**Sample ID**	MW-04-05(6)_052323	**Sampled by**	Anyssa Mandich
Sample Time	15:20	**Gallons Purged**	2	**Replicate/ Code No.**	MW-04-05(6)_052323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	125	11.02	0.17	7.46	2.22	5.49	0.32	13.5	-79	Clear	None
14:55	5	5	125	11.78	0.33	7.45	2.21	1.77	0.14	13.4	-96	Clear	None
15:00	5	10	125	12.27	0.50	7.45	2.2	1.09	0.13	13.3	-102.8	Clear	None
15:05	5	15	125	13.00	0.66	7.44	2.2	0.85	0.09	13.3	-109	Clear	None
15:10	5	20	125	13.20	0.83	7.45	2.23	0.86	0.09	13.8	-112.4	Clear	None
15:15	5	25	125	13.20	0.99	7.43	2.23	0.89	0.09	13.7	-113.8	Clear	None
15:20	5	30	125	13.41	1.16	7.43	2.21	1.3	0.09	13.6	-115.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	40 mL Glass	6	HCL

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6

Well Locked at Arrival:

Condition of Well: Good condition

Well Locked at Departure:

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-12			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	61 °F, Windy, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.40	**Total Depth (ft-bmp)**	17.19	**Water Column (ft)**	8.79	**Gallons in Well**	1.43
Purge Start	10:40	**Pump Intake (ft-bmp)**	15.75	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:20	**Volumes Purged**	1.40	**Sample ID**	MW-12-12_052423	**Sampled by**	Anyssa Mandich
Sample Time	11:20	**Gallons Purged**	2	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	150	9.90	0.20	7.52	0.79	3.03	0.38	11.4	34.7	Clear	None
10:50	5	5	125	10.42	0.36	7.52	0.77	3.06	0.21	11.5	29.8	Clear	None
10:55	5	10	125	11.09	0.53	7.58	0.78	2.6	0.15	11.5	26.6	Clear	None
11:00	5	15	125	11.61	0.69	7.57	0.79	3	0.15	11.5	24	Clear	None
11:05	5	20	125	12.08	0.86	7.54	0.8	1.99	0.14	11.5	23.4	Clear	None
11:10	5	25	125	12.53	1.02	7.52	0.81	3.09	0.14	11.4	23.2	Clear	None
11:15	5	30	125	12.79	1.19	7.5	0.81	2.84	0.15	11.4	23.5	Clear	None
11:20	5	35	125	13.04	1.35	7.49	0.82	3	0.15	11.5	23.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-13			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	59.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.51	**Total Depth (ft-bmp)**	23.5	**Water Column (ft)**	11.99	**Gallons in Well**	1.95
Purge Start	11:45	**Pump Intake (ft-bmp)**	22	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:50	**Volumes Purged**	1.03	**Sample ID**	MW-12-13_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	12:45	**Gallons Purged**	2	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	100	12.19	0.13	7.53	0.59	4.07	1.85	11.7	118	Clear	None
11:55	5	5	100	12.30	0.26	7.54	0.59	2.77	1.8	11.9	112.9	Clear	None
12:00	5	10	100	12.43	0.40	7.54	0.59	5.76	1.8	11.7	107.5	Clear	None
12:05	5	15	100	12.58	0.53	7.53	0.58	5.17	1.65	11.4	101.8	Clear	None
12:10	5	20	100	12.68	0.66	7.53	0.58	4.29	1.59	11.3	97.3	Clear	None
12:15	5	25	100	12.77	0.79	7.52	0.58	3.76	1.32	11.5	90.3	Clear	None
12:20	5	30	100	12.82	0.92	7.52	0.58	4.16	1.19	11.5	79.5	Clear	None
12:25	5	35	100	12.85	1.06	7.51	0.58	5.41	1.03	11.4	64	Clear	None
12:30	5	40	100	12.86	1.19	7.51	0.58	4.9	1.06	11.6	48.9	Clear	None
12:35	5	45	100	12.88	1.32	7.5	0.58	1.97	0.93	11.5	34.2	Clear	None
12:40	5	50	100	12.94	1.45	7.5	0.58	4.19	0.82	11.5	20.1	Clear	None
12:45	5	55	100	12.94	1.59	7.49	0.58	1.8	0.7	11.5	5.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Tablet deleted readings before 1100.
Well casing with j plug causes metal protective casing to catch and could cause a pinch point. Removed j plug and added plastic water bottle end as a temporary cap until well casing can be cut down and resurveyed.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-21			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	64.4 degrees F and Clear. The wind is blowing SW at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.40	**Total Depth (ft-bmp)**	78.1	**Water Column (ft)**	13.70	**Gallons in Well**	2.23
Purge Start	11:20	**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:15	**Volumes Purged**	0.65	**Sample ID**	MW-12-21_051923	**Sampled by**	Billy Cobern
Sample Time	12:15	**Gallons Purged**	1.45	**Replicate/ Code No.**	DUP-05_051923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:25	0	0	100	64.75	0.13	6.91	1.85	19.2	4.78	17.1	-18.9	Clear	None
11:30	5	5	100	64.95	0.26	6.89	1.84	18.3	3.07	17.5	-24.2	Clear	None
11:35	5	10	100	65.15	0.40	6.87	1.83	14.8	2.21	17.7	-30.1	Clear	None
11:40	5	15	100	65.34	0.53	6.86	1.83	14.6	1.67	17.9	-33.5	Clear	None
11:45	5	20	100	65.52	0.66	6.86	1.83	11.7	1.32	18.1	-36.1	Clear	None
11:50	5	25	100	65.70	0.79	6.86	1.84	10.2	1.16	181	-38.1	Clear	None
11:55	5	30	100	65.89	0.92	6.86	1.85	9.7	1.01	17.9	-41.5	Clear	None
12:00	5	35	100	66.07	1.06	6.85	1.85	9.62	0.88	18	-43.5	Clear	None
12:05	5	40	100	66.07	1.19	6.85	1.85	9.34	0.8	18	-45.4	Clear	None
12:10	5	45	100	66.21	1.32	6.85	1.85	9.07	0.79	18	-47.2	Clear	None
12:15	5	50	100	66.35	1.45	6.85	1.85	8.79	0.77	18.1	-48.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-22			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	64.4 degrees F and Clear. The wind is blowing SW at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.52	**Total Depth (ft-bmp)**	96.15	**Water Column (ft)**	28.63	**Gallons in Well**	4.65
Purge Start	10:15	**Pump Intake (ft-bmp)**	93	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:50	**Volumes Purged**	0.20	**Sample ID**	MW-13-22_051923	**Sampled by**	Billy Cobern
Sample Time	10:50	**Gallons Purged**	0.92	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	100	67.79	0.13	7.04	2.03	37	5.93	19.9	7.8	Clear	None
10:25	5	5	100	67.79	0.26	6.83	2.03	16.7	2.74	17.8	-1	Clear	None
10:30	5	10	100	67.79	0.40	6.81	2.03	12.2	1.69	17.2	-2.5	Clear	None
10:35	5	15	100	67.79	0.53	6.81	2.02	10.7	1.52	17.4	-3.4	Clear	None
10:40	5	20	100	67.79	0.66	6.81	2.01	9.09	1.4	17.5	-4	Clear	None
10:45	5	25	100	67.79	0.79	6.81	2.01	8.78	1.42	17.5	-4.5	Clear	None
10:50	5	30	100	67.79	0.92	6.81	2.01	8.57	1.39	17.6	-5.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-26			**Date**	5/20/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	50.0 degrees F and Cloudy. The wind is blowing W at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.70	**Total Depth (ft-bmp)**	79.2	**Water Column (ft)**	15.50	**Gallons in Well**	2.52
Purge Start	10:20	**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:10	**Volumes Purged**	0.52	**Sample ID**	MW-13-26_052023	**Sampled by**	Billy Cobern
Sample Time	11:10	**Gallons Purged**	1.32	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:25	0	0	100	63.85	0.13	7.2	1.05	11.1	2.61	12.5	33.6	Clear	None
10:30	5	5	100	63.85	0.26	7.08	1.05	15.6	0.93	12.5	29.6	Clear	None
10:35	5	10	100	63.85	0.40	7.04	1.06	19.2	0.65	12.4	25.4	Clear	None
10:40	5	15	100	63.85	0.53	7.02	1.06	17.7	0.5	12.4	18.8	Clear	None
10:45	5	20	100	63.85	0.66	7.01	1.07	14.3	0.48	12.3	12.2	Clear	None
10:50	5	25	100	63.85	0.79	7.01	1.07	12.4	0.44	12.3	6.6	Clear	None
10:55	5	30	100	63.85	0.92	7	1.08	11.3	0.33	12.3	1.1	Clear	None
11:00	5	35	100	63.85	1.06	7	1.09	10.2	0.37	12.3	-3.5	Clear	None
11:05	5	40	100	63.85	1.19	7	1.1	9.81	0.36	12.3	-8.3	Clear	None
11:10	5	45	100	63.85	1.32	7	1.11	9.92	0.36	12.3	-10.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-27			**Date**	5/20/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	50.0 degrees F and Cloudy. The wind is blowing W/NW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.98	**Total Depth (ft-bmp)**	75.7	**Water Column (ft)**	10.72	**Gallons in Well**	1.74
Purge Start	07:35	**Pump Intake (ft-bmp)**	73	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	08:30	**Volumes Purged**	0.83	**Sample ID**	MW-13-27_052023	**Sampled by**	Billy Cobern
Sample Time	08:30	**Gallons Purged**	1.45	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
07:40	0	0	100	65.05	0.13	6.82	1.9	10.3	0.63	12.9	-13.8	Clear	None
07:45	5	5	100	65.02	0.26	6.82	1.92	16.8	0.59	12.8	-17.2	Clear	None
07:50	5	10	100	65.02	0.40	6.82	1.94	23.8	0.64	12.6	-20.4	Clear	None
07:55	5	15	100	65.02	0.53	6.82	1.94	29.3	0.5	12.5	-21.6	Clear	None
08:00	5	20	100	65.02	0.66	6.82	1.94	24.1	0.59	12.5	-22.5	Clear	None
08:05	5	25	100	65.02	0.79	6.82	1.95	16.9	0.74	12.4	-23.3	Clear	None
08:10	5	30	100	65.02	0.92	6.82	1.95	12.3	0.78	12.3	-24.1	Clear	None
08:15	5	35	100	65.02	1.06	6.82	1.95	10	0.67	12.2	-24.8	Clear	None
08:20	5	40	100	65.02	1.19	6.82	1.96	9.7	0.74	12.1	-25.6	Clear	None
08:25	5	45	100	65.02	1.32	6.82	1.96	9.34	0.75	12.1	-26.2	Clear	None
08:30	5	50	100	65.02	1.45	6.82	1.96	9.41	0.79	12.1	-27.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-29			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	71 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	35.42	**Total Depth (ft-bmp)**	76.3	**Water Column (ft)**	40.88	**Gallons in Well**	6.64
Purge Start	11:45	**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:25	**Volumes Purged**	0.11	**Sample ID**	MW-13-29_052323	**Sampled by**	Anyssa Mandich
Sample Time	12:25	**Gallons Purged**	0.75	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	125	35.42	0.17	6.44	2.34	145	3.15	20.9	179.7	Clear	None
11:55	5	5	125	38.97	0.33	6.44	1.62	137	3.57	18	167.4	Clear	None
12:00	5	10	125	40.23	0.50	6.45	2.94	122	3.27	19	157	Clear	None
12:05	5	15	125	44.20	0.66	6.44	2.96	118	3.37	18.9	142.2	Clear	None
12:10	5	20	125	43.20	0.83	6.44	2.9	136	3.37	19	140.6	Clear	None
12:15	5	25	125	46.98	0.99	6.46	3	119	3.32	18.9	132.9	Clear	None
12:20	5	30	125	46.98	1.16	6.46	3.02	123	3.43	18.9	129.4	Clear	None
12:25	5	35	125	45.21	1.32	6.44	3	118	3.51	18.9	124.5	Clear	None

Constituent Sampled	Container	Number	Preservative
TKN, Total P	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
Nitrogen, Nitrate-Nitrite	125 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-30			**Date**	5/20/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	51.1 degrees F and Cloudy. The wind is blowing W at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.65	**Total Depth (ft-bmp)**	79.8	**Water Column (ft)**	14.15	**Gallons in Well**	2.30
Purge Start	09:00	**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:50	**Volumes Purged**	0.57	**Sample ID**	MW-13-30_052023	**Sampled by**	Billy Cobern
Sample Time	09:50	**Gallons Purged**	1.32	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:05	0	0	100	65.75	0.13	7.18	1.07	27.8	7.88	11.8	33.6	Clear	None
09:10	5	5	100	65.85	0.26	6.81	1.25	36.3	1.08	12.3	-22.5	Clear	None
09:15	5	10	100	65.95	0.40	6.8	1.25	30.6	1.03	12.3	-25.7	Clear	None
09:20	5	15	100	65.95	0.53	6.8	1.25	27.2	1.01	12.2	-28.2	Clear	None
09:25	5	20	100	65.95	0.66	6.8	1.25	25.1	1.02	12.1	-29.9	Clear	None
09:30	5	25	100	65.95	0.79	6.8	1.25	21.7	0.99	12	-31	Clear	None
09:35	5	30	100	65.95	0.92	6.79	1.25	18.9	1.01	11.9	-32.1	Clear	None
09:40	5	35	100	65.95	1.06	6.79	1.25	17.8	0.95	11.8	-33.1	Clear	None
09:45	5	40	100	65.95	1.19	6.79	1.25	16.6	0.9	11.7	-34.1	Clear	None
09:50	5	45	100	65.95	1.32	6.79	1.25	16.9	0.9	11.7	-35.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-34			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	53.1 degrees F and Clear. The wind is blowing S/SE at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.98	**Total Depth (ft-bmp)**	79.9	**Water Column (ft)**	15.92	**Gallons in Well**	2.59
Purge Start	09:10	**Pump Intake (ft-bmp)**	77	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:45	**Volumes Purged**	0.36	**Sample ID**	MW-13-34_051923	**Sampled by**	Billy Cobern
Sample Time	09:45	**Gallons Purged**	0.92	**Replicate/ Code No.**	MW-13-34_051923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	100	64.24	0.13	7.24	2.24	28.7	5.83	17.2	-20.7	Clear	None
09:20	5	5	100	64.24	0.26	7.09	2.28	25	2.07	15.3	-49.7	Clear	None
09:25	5	10	100	64.24	0.40	7.08	2.28	20.1	1	15	-64.3	Clear	None
09:30	5	15	100	64.24	0.53	7.06	2.31	17.8	1	14.9	-73.4	Clear	None
09:35	5	20	100	64.24	0.66	7.05	2.33	15.2	1.02	15	-78.5	Clear	None
09:40	5	25	100	64.24	0.79	7.05	2.33	15	0.98	14.9	-79.2	Clear	None
09:45	5	30	100	64.24	0.92	7.05	2.33	14.8	0.99	15	-80	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-36R			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	61 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.94	**Total Depth (ft-bmp)**	12.62	**Water Column (ft)**	5.68	**Gallons in Well**	0.92
Purge Start	11:45	**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:35	**Volumes Purged**	2.72	**Sample ID**	MW-13-36R_052423	**Sampled by**	Anyssa Mandich
Sample Time	12:35	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	125	6.98	0.17	10.13	0.489	2.15	5.18	13.6	90.2	Clear	None
11:55	5	5	125	6.98	0.33	10.12	0.487	2.96	4.66	13.6	85.9	Clear	None
12:00	5	10	125	6.98	0.50	11.44	0.77	4.44	2.08	13.1	49.8	Clear	None
12:05	5	15	125	6.98	0.66	11.71	1.12	4.4	0.61	12.8	22.6	Clear	None
12:10	5	20	125	6.98	0.83	11.84	1.26	4.65	0.24	12.5	5.2	Clear	None
12:15	5	25	125	6.98	0.99	11.94	1.31	4.84	0.15	12.7	-14.1	Clear	None
12:20	5	30	125	6.98	1.16	11.97	1.32	2.6	0.15	12.5	-23.8	Clear	None
12:25	5	35	125	6.98	1.32	12	1.34	3.09	0.14	12.3	-33.2	Clear	None
12:30	5	40	125	6.98	1.49	12.02	1.35	2.23	0.14	12.3	-39.7	Clear	None
12:35	5	45	125	6.98	1.65	12.06	1.37	2.78	0.14	12.3	-42.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-13-43	**Date(s):**	2023-05-16	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:74.21 °F, rH:35%, Clouds: 0%, Wind:13.8mph W-SW			**Field Technician:**		Austin Westhuis	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	55.43	**Total Depth (ft-bmp):**	77.7	**Water Column(ft):**	22.27	**Gallons in Well:**	3.5632
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Dedicated Bladder
Purge Start Time:	14:10	**Total Volume Purged (milliliters):**	7000	**Sample ID:**	MW-13-43_051623	**Sample Time:**	14:40
Purge End Time:	14:40	**Well Volumes Purged (total):**	0.52	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI ProPlus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
14:15	0	200	mL/min	55.43	7.18	0.91	382	11.94	16.9	-43.3	Clear	No Odor
14:20	5	200	mL/min	55.43	7.12	2.45	331	11.2	16.7	128.1	Clear	No Odor
14:25	10	200	mL/min	55.43	7.15	2.64	309	11.12	16.7	129.1	Clear	No Odor
14:30	15	200	mL/min	55.43	7.22	2.69	259	11.06	16.7	129.9	Clear	No Odor
14:35	20	200	mL/min	55.43	7.22	2.69	214	10.57	17.1	129.9	Clear	No Odor
14:40	25	200	mL/min	55.43	7.24	2.74	297	10.51	17	128.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8260B-SIMS	Clear Glass	3	HCl

Comments: Turbidity did not stabilize near the active biosparge transect.

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-13-45	**Date(s):**	2023-05-16	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:76.73 °F, rH:33%, Clouds: 0%, Wind:16.11mph W			**Field Technician:**		Austin Westhuis	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	64.51	**Total Depth (ft-bmp):**	78.32	**Water Column(ft):**	13.81	**Gallons in Well:**	2.21
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Dedicated Bladder
Purge Start Time:	15:50	**Total Volume Purged (milliliters):**	9000	**Sample ID:**	MW-13-45_051623	**Sample Time:**	16:30
Purge End Time:	16:30	**Well Volumes Purged (total):**	1.08	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI ProPlus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
15:55	0	200	mL/min	64.51	6.4	1.43	22.6	8.05	15	0.1	Clear	No Odor
16:00	5	200	mL/min	64.51	6.47	1.44	11.58	7.07	15	-15.6	Clear	No Odor
16:05	10	200	mL/min	64.53	6.49	1.44	7.54	6.58	15.1	-22.2	Clear	No Odor
16:10	15	200	mL/min	64.53	6.52	1.43	5.63	6.52	15.1	-29.3	Clear	No Odor
16:15	20	200	mL/min	64.54	6.52	1.43	5.11	5.77	15	-32	Clear	No Odor
16:20	25	200	mL/min	64.54	6.54	1.43	4.89	5.71	15.1	-38.4	Clear	No Odor
16:25	30	200	mL/min	64.54	6.54	1.43	4.39	5.68	15.1	-39	Clear	No Odor
16:30	35	200	mL/min	64.54	6.54	1.43	4.29	5.61	15	-41.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8260B-SIMS	Clear Glass	3	HCl

Comments: Turbidity did not stabilize near the active biosparge transect.

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-48			**Date**	5/19/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	53.1 degrees F and Clear. The wind is blowing S/SE at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	55.58	**Total Depth (ft-bmp)**	73.25	**Water Column (ft)**	17.67	**Gallons in Well**	2.87
Purge Start	08:05	**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	08:45	**Volumes Purged**	0.37	**Sample ID**	MW-13-48_051923	**Sampled by**	Billy Cobern
Sample Time	08:45	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:10	0	0	100	55.88	0.13	6.79	2.6	21.2	0.63	14.9	207.1	Clear	None
08:15	5	5	100	55.88	0.26	6.78	2.59	17.3	0.61	15.2	206.1	Clear	None
08:20	5	10	100	55.88	0.40	6.78	2.58	15.4	0.65	15.3	205.4	Clear	None
08:25	5	15	100	55.88	0.53	6.78	2.59	12.1	0.65	15.5	204.7	Clear	None
08:30	5	20	100	55.88	0.66	6.78	2.6	10.3	0.63	15.6	204.2	Clear	None
08:35	5	25	100	55.88	0.79	6.78	2.59	9.84	0.59	15.7	203.6	Clear	None
08:40	5	30	100	55.88	0.92	6.78	2.6	9.57	0.65	15.8	203.1	Clear	None
08:45	5	35	100	55.88	1.06	6.78	2.6	9.49	0.63	15.7	202.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-14-58R	**Date(s):**	2023-05-16	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:76.33 °F, rH:33%, Clouds: 0%, Wind:16.11mph W			**Field Technician:**		J. Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	12.83	**Total Depth (ft-bmp):**	15.35	**Water Column(ft):**	2.52	**Gallons in Well:**	0.4032
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	15:35	**Total Volume Purged (milliters):**	10000	**Sample ID:**	MW-14-58R_051623	**Sample Time:**	16:30
Purge End Time:	16:25	**Well Volumes Purged (total):**	6.55	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
15:40	0	200	mL/min	12.88	7.45	3.05	1.01	1.32	13.9	200.9	Clear	No Odor
15:45	5	200	mL/min	12.88	7.51	3.07	0.02	0.6	13.9	191.1	Clear	No Odor
15:50	10	200	mL/min	12.88	7.53	3.03	0.47	0.72	13.9	185.4	Clear	No Odor
15:55	15	200	mL/min	12.88	7.52	3.03	1.48	0.45	14	181.7	Clear	No Odor
16:00	20	200	mL/min	12.88	7.26	3.08	1.46	0.72	14.2	154.4	Clear	No Odor
16:05	25	200	mL/min	12.88	6.98	3.1	0.82	0.16	14.2	120.7	Clear	No Odor
16:10	30	200	mL/min	12.88	6.98	3.1	0.67	0.13	14.2	109.6	Clear	No Odor
16:15	35	200	mL/min	12.88	6.98	3.1	0.36	0.09	14.3	102.4	Clear	No Odor
16:20	40	200	mL/min	12.88	6.98	3.09	1	0.08	14.4	96.9	Clear	No Odor
16:25	45	200	mL/min	12.88	6.98	3.09	1.27	0.16	14.2	92.5	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
VOC, 1,4-D	40 mL Glass	3	HCl

Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-61			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	50.0 degrees F and Clear. The wind is blowing E/NE at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.87	**Total Depth (ft-bmp)**	77.4	**Water Column (ft)**	11.53	**Gallons in Well**	1.87
Purge Start	11:25	**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:20	**Volumes Purged**	0.78	**Sample ID**	MW-14-61_051723	**Sampled by**	Billy Cobern
Sample Time	12:20	**Gallons Purged**	1.45	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	100	66.11	0.13	7.28	2.62	36.7	6.65	13.9	226.4	Clear	None
11:35	5	5	100	66.17	0.26	7.12	2.66	39.1	4.21	14	230.5	Clear	None
11:40	5	10	100	66.19	0.40	7.1	2.67	33.4	4.01	14	231.5	Clear	None
11:45	5	15	100	66.19	0.53	7.06	2.69	28.7	2.92	13.8	234.5	Clear	None
11:50	5	20	100	66.19	0.66	7.06	2.7	28.8	2.69	13.8	235.5	Clear	None
11:55	5	25	100	66.19	0.79	7.1	2.68	25.9	3.75	13.6	237.4	Clear	None
12:00	5	30	100	66.19	0.92	7.12	2.66	23.8	4.17	13.8	239.5	Clear	None
12:05	5	35	100	66.19	1.06	7.08	2.68	22.8	3.13	13.9	241.2	Clear	None
12:10	5	40	100	66.19	1.19	7.03	2.7	22.4	2.11	14	240	Clear	None
12:15	5	45	100	66.19	1.32	7.03	2.71	20.8	2.07	14	239.7	Clear	None
12:20	5	50	100	66.19	1.45	7.03	2.7	21.1	2.11	14	239.1	Clear	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
TKN/Total Phosphorus	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-15-72			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	48.9 degrees F and Clear. The wind is blowing NE at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.70	**Total Depth (ft-bmp)**	70.35	**Water Column (ft)**	13.65	**Gallons in Well**	2.22
Purge Start	10:20	**Pump Intake (ft-bmp)**	67.85	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:55	**Volumes Purged**	0.83	**Sample ID**	MW-15-72_051723	**Sampled by**	Austin Westhuis
Sample Time	10:50	**Gallons Purged**	1.85	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:25	0	0	200	56.70	0.26	6.88	1.09	24.4	5.17	14.2	-49.3	Clear	None
10:30	5	5	200	56.70	0.53	6.87	1.11	14.3	4.66	14.2	-59.8	Clear	None
10:35	5	10	200	56.70	0.79	6.87	1.12	5.33	3.88	14.2	-74.1	Clear	None
10:40	5	15	200	56.70	1.06	6.86	1.13	4.12	3.42	14.2	-77.8	Clear	None
10:45	5	20	200	56.70	1.32	6.86	1.13	3.69	3.35	14.2	-81.1	Clear	None
10:50	5	25	200	56.70	1.59	6.86	1.13	3.41	3.31	14.1	-83.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-74			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.50	**Total Depth (ft-bmp)**	73.68	**Water Column (ft)**	9.18	**Gallons in Well**	1.49
Purge Start	10:00	**Pump Intake (ft-bmp)**	71.2	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**	1.95	**Sample ID**	MW-16-74_051723	**Sampled by**	Donald Richmond
Sample Time	11:00	**Gallons Purged**	2.9	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	200	64.50	1.06	6.72	1.85	714	0.31	14.1	29.3	Gray	None
10:25	5	5	200	64.50	1.32	6.71	1.85	584	0.53	14.2	26.8	Gray	None
10:30	5	10	200	64.50	1.59	6.71	1.85	478	0.3	14.3	22	Gray	None
10:35	5	15	200	64.50	1.85	6.71	1.85	368	0.28	14.2	20.1	Gray	None
10:40	5	20	200	64.50	2.11	6.71	1.85	306	0.33	14.2	17.8	Gray	None
10:45	5	25	200	64.50	2.38	6.71	1.85	275	0.29	14.4	15.4	Gray	None
10:50	5	30	200	64.50	2.64	6.71	1.85	235	0.28	14.3	13	Gray	None
10:55	5	35	200	64.50	2.91	6.71	1.85	213	0.27	14.3	12.4	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-16-75	**Date(s):**	2023-05-16	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:16.88 °C, rH:40%, Clouds: 0%, Wind:0m/s N			**Field Technician:**		Donald Richmond	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (m-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (m-bmp):	60.78	**Total Depth (m-bmp):**	74.45	**Water Column(m):**	13.67	**Liters in Well:**	27.71
Depth to Product (m-bmp):	NA	**Pump Intake Depth(m-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Dedicated Bladder
Purge Start Time:	13:00	**Total Volume Purged (milliliters):**	12000	**Sample ID:**	MW-16-75	**Sample Time:**	14:00
Purge End Time:	14:00	**Well Volumes Purged (total):**	0.11	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / 3690, 5943
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:05	0	200	mL/min	60.78	6.89	1.72	10.6	2.12	16.9	160	Clear	No Odor
13:10	5	200	mL/min	60.78	6.78	1.84	3.9	0.92	18.1	116.2	Clear	No Odor
13:15	10	200	mL/min	60.78	6.78	1.94	3.02	0.47	18.5	65.5	Clear	No Odor
13:20	15	200	mL/min	60.78	6.78	1.97	2.43	0.39	19.1	33.7	Clear	No Odor
13:25	20	200	mL/min	60.78	6.78	1.98	38.4	0.35	19.8	12.9	Clear	No Odor
13:30	25	200	mL/min	60.78	6.78	2.04	114	0.33	19.3	-4.6	Clear	No Odor
13:35	30	200	mL/min	60.78	6.78	2.04	106	0.32	19.4	-11.2	Clear	No Odor
13:40	35	200	mL/min	60.78	6.79	2.05	91.9	0.29	19.9	-19.9	Clear	No Odor
13:45	40	200	mL/min	60.78	6.79	2.04	79.3	0.28	20	-26.1	Clear	No Odor
13:50	45	200	mL/min	60.78	6.8	2.03	60.8	0.26	20	-33.2	Clear	No Odor
13:55	50	200	mL/min	60.78	6.8	2.04	57.8	0.26	20.6	-37.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4 D	Clear Glass	3	HCl

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-16-77	**Date(s):**	2023-05-17	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:16.88 °C, rH:40%, Clouds: 0%, Wind:0m/s N			**Field Technician:**		Donald Richmond	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (m-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (m-bmp):	59.8	**Total Depth (m-bmp):**	73.98	**Water Column(m):**	14.18	**Gallons in Well:**	2.2688
Depth to Product (m-bmp):	NA	**Pump Intake Depth(m-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Dedicated Bladder
Purge Start Time:	8:25	**Total Volume Purged (milliliters):**	12000	**Sample ID:**	MW-16-77_051723	**Sample Time:**	09:15
Purge End Time:	09:15	**Well Volumes Purged (total):**	1.40	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
08:30	0	200	mL/min	59.8	6.84	3.04	15.7	1.46	11.8	61.3	Clear	No Odor
08:35	5	200	mL/min	59.8	6.94	3.03	16	2.7	11.3	59.1	Clear	No Odor
08:40	10	200	mL/min	59.8	6.94	3.03	16.9	1.86	11.3	59	Clear	No Odor
08:45	15	200	mL/min	59.8	6.83	3.14	40	2.27	11.8	57.8	Clear	No Odor
08:50	20	200	mL/min	59.8	6.95	3.15	24.7	2.62	11.6	50.4	Clear	No Odor
08:55	25	200	mL/min	59.8	6.85	3.16	157	2.02	11.8	43.1	Clear	No Odor
09:00	30	200	mL/min	59.8	6.86	3.17	623	2.2	11.9	38.9	Clear	No Odor
09:05	35	200	mL/min	59.8	6.85	3.17	197	1.59	11.9	36.6	Clear	No Odor
09:10	40	200	mL/min	59.8	6.86	3.17	139	1.47	11.9	34.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4 D	Clear Glass	3	HCl

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-78			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	50.0 degrees F and Clear. The wind is blowing E/NE at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.44	**Total Depth (ft-bmp)**	76.19	**Water Column (ft)**	11.75	**Gallons in Well**	1.91
Purge Start	11:25	**Pump Intake (ft-bmp)**	61.94	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:55	**Volumes Purged**	0.83	**Sample ID**	MW-16-78_051723	**Sampled by**	Austin Westhuis
Sample Time	11:50	**Gallons Purged**	1.59	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	200	64.44	0.26	6.87	1.17	11.6	0.22	13	-102.5	Clear	None
11:35	5	5	200	64.44	0.53	6.88	1.17	6.23	0.21	12.9	-101.3	Clear	None
11:40	5	10	200	64.44	0.79	6.9	1.17	3.09	0.16	12.9	-92.9	Clear	None
11:45	5	15	200	64.44	1.06	6.9	1.18	2.69	0.15	12.9	-88.3	Clear	None
11:50	5	20	200	64.44	1.32	6.91	1.18	2.34	0.15	12.9	-85.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-81			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.10	**Total Depth (ft-bmp)**	77.21	**Water Column (ft)**	13.11	**Gallons in Well**	2.13
Purge Start	11:30	**Pump Intake (ft-bmp)**	74.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:05	**Volumes Purged**	0.75	**Sample ID**	MW-16-81_051723	**Sampled by**	Donald Richmond
Sample Time	12:05	**Gallons Purged**	1.59	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:40	0	0	200	64.10	0.53	6.62	2.42	3.9	1.32	15.9	55	Gray	None
11:45	5	5	200	64.10	0.79	6.62	2.48	1.52	1.06	16.1	55.5	Gray	None
11:50	5	10	200	64.10	1.06	6.61	2.67	18	0.73	16	55.7	Gray	None
11:55	5	15	200	64.10	1.32	6.62	2.68	17.5	0.8	16	55.3	Gray	None
12:00	5	20	200	64.10	1.59	6.62	2.69	17.3	0.79	16.2	55.3	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-82			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Clear. The wind is blowing E/NE at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.24	**Total Depth (ft-bmp)**	77.17	**Water Column (ft)**	11.93	**Gallons in Well**	1.94
Purge Start	12:20	**Pump Intake (ft-bmp)**	74.67	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:50	**Volumes Purged**	0.82	**Sample ID**	MW-16-82_051723	**Sampled by**	Austin Westhuis
Sample Time	12:45	**Gallons Purged**	1.59	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:25	0	0	200	65.24	0.26	6.93	1.02	34.7	0.29	14.9	-74.7	Clear	None
12:30	5	5	200	65.24	0.53	6.94	1.03	5.99	0.25	14.9	-71.1	Clear	None
12:35	5	10	200	65.24	0.79	6.93	1.03	3.31	0.22	14.8	-69.8	Clear	None
12:40	5	15	200	65.24	1.06	6.94	1.03	2.92	0.22	14.8	-75.2	Clear	None
12:45	5	20	200	65.24	1.32	6.95	1.03	2.81	0.21	14.8	-72.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-84			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.46	**Total Depth (ft-bmp)**	81.15	**Water Column (ft)**	12.69	**Gallons in Well**	2.06
Purge Start	12:55	**Pump Intake (ft-bmp)**	78.65	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:55	**Volumes Purged**	1.41	**Sample ID**	MW-16-84_051723	**Sampled by**	Donald Richmond
Sample Time	13:55	**Gallons Purged**	2.9	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:05	0	0	200	68.46	0.53	7.03	1.19	5.53	0.48	15.8	36	Gray	None
13:10	5	5	200	68.46	0.79	7.02	1.21	30.3	0.37	15.9	31.4	Gray	None
13:15	5	10	200	68.46	1.06	6.96	1.52	105	0.26	15.8	21.3	Gray	None
13:20	5	15	200	68.46	1.32	6.95	1.69	113	0.27	15.8	7.1	Gray	None
13:25	5	20	200	68.46	1.59	6.95	1.74	91.4	0.21	15.7	-2.9	Gray	None
13:30	5	25	200	68.46	1.85	6.95	1.76	79.1	0.24	16	-8.4	Gray	None
13:35	5	30	200	68.46	2.11	6.95	1.79	67.7	0.21	15.9	-18.3	Gray	None
13:40	5	35	200	68.46	2.38	6.95	1.81	56.7	0.22	16.1	-27.4	Gray	None
13:45	5	40	200	68.46	2.64	6.95	1.82	51.4	0.21	16	-30.7	Gray	None
13:50	5	45	200	68.46	2.91	6.95	1.82	46.5	0.23	16	-32.3	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-85			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.07	**Total Depth (ft-bmp)**	71.6	**Water Column (ft)**	13.53	**Gallons in Well**	2.20
Purge Start	15:30	**Pump Intake (ft-bmp)**	69.1	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:30	**Volumes Purged**	1.32	**Sample ID**	MW-16-85_051823	**Sampled by**	Donald Richmond
Sample Time	16:30	**Gallons Purged**	2.9	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:40	0	0	200	58.07	0.53	7.47	0.61	20.9	3.32	16.1	45.8	Clear	None
15:45	5	5	200	58.07	0.79	7.43	0.6	21.1	4.18	15.9	50.4	Clear	None
15:50	5	10	200	58.07	1.06	7.42	0.6	27.7	4.62	16.2	53.1	Clear	None
15:55	5	15	200	58.07	1.32	7.42	0.6	24.5	4.25	16.3	54.5	Clear	None
16:00	5	20	200	58.07	1.59	7.36	0.62	12.3	3.1	17.7	55.5	Clear	None
16:05	5	25	200	58.07	1.85	7.23	0.7	161	1.72	18.2	48.5	Clear	None
16:10	5	30	200	58.07	2.11	7.18	0.75	222	0.9	18.1	27.4	Clear	None
16:15	5	35	200	58.07	2.38	7.18	0.76	238	0.75	18.5	19.2	Clear	None
16:20	5	40	200	58.07	2.64	7.17	0.78	243	0.64	18.1	9.6	Clear	None
16:25	5	45	200	58.07	2.91	7.17	0.79	214	0.58	18	2.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-17-86			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.39	**Total Depth (ft-bmp)**	81.42	**Water Column (ft)**	16.03	**Gallons in Well**	2.60
Purge Start	14:40	**Pump Intake (ft-bmp)**	78.9	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:40	**Volumes Purged**	1.12	**Sample ID**	MW-17-86_051723	**Sampled by**	Donald Richmond
Sample Time	15:40	**Gallons Purged**	2.9	**Replicate/ Code No.**	MW-17-86_051723	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	200	65.39	0.53	7.38	1.68	5.28	5.25	16.5	57.5	Clear	None
14:55	5	5	200	65.39	0.79	7.26	1.7	4.24	4.79	16.6	55	Clear	None
15:00	5	10	200	65.39	1.06	7.06	1.8	2.16	3.2	16.7	43.3	Clear	None
15:05	5	15	200	65.39	1.32	6.96	1.88	3.92	2.53	16.8	33	Clear	None
15:10	5	20	200	65.39	1.59	6.95	1.96	3.06	2.13	16.7	-1.2	Clear	None
15:15	5	25	200	65.39	1.85	6.94	1.98	2.71	1.71	16.6	-6.7	Clear	None
15:20	5	30	200	65.39	2.11	6.94	1.99	1.77	1.49	16.7	-17.7	Clear	None
15:25	5	35	200	65.39	2.38	6.94	1.98	1.67	1.26	16.6	-26.9	Clear	None
15:30	5	40	200	65.39	2.64	6.95	1.98	2.55	0.97	16.5	-32.6	Clear	None
15:35	5	45	200	65.39	2.91	6.95	1.99	1.93	0.86	16.7	-35.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-88			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	61.0 degrees F and Mostly Cloudy. The wind is blowing NE at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.64	**Total Depth (ft-bmp)**	11	**Water Column (ft)**	5.36	**Gallons in Well**	0.87
Purge Start	13:45	**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:40	**Volumes Purged**	1.72	**Sample ID**	MW-18-88_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	14:35	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	100	5.86	0.13	7.13	0.53	3.67	0.34	13.4	103.8	Clear	None
13:55	5	5	100	5.86	0.26	7.15	0.53	2.54	0.86	13.8	97.4	Clear	None
14:00	5	10	100	5.82	0.40	7.15	0.53	2.52	0.3	14	91.9	Clear	None
14:05	5	15	100	5.82	0.53	7.15	0.53	1.83	0.42	13.9	89.6	Clear	None
14:10	5	20	100	5.82	0.66	7.16	0.53	1.51	0.45	13.9	86	Clear	None
14:15	5	25	100	5.82	0.79	7.15	0.53	1.94	0.36	13.8	82.8	Clear	None
14:20	5	30	100	5.82	0.92	7.15	0.53	1.46	0.36	13.9	79.3	Clear	None
14:25	5	35	100	5.82	1.06	7.15	0.53	1.33	0.28	13.8	76.6	Clear	None
14:30	5	40	100	5.82	1.19	7.14	0.53	1.39	0.27	13.7	73.3	Clear	None
14:35	5	45	100	5.82	1.32	7.14	0.53	1.23	0.29	13.6	71.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-95			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	62.1 degrees F and Clear. The wind is blowing E/NE at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.02	**Total Depth (ft-bmp)**	10	**Water Column (ft)**	2.98	**Gallons in Well**	0.48
Purge Start	16:30	**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:00	**Volumes Purged**	2.60	**Sample ID**	MW-18-95_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	16:55	**Gallons Purged**	1.25	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:35	0	0	150	7.48	0.20	7.5	0.407	11.6	1.28	13.2	102.1	Clear	None
16:40	5	5	150	7.48	0.40	7.54	0.411	7.01	1.53	13.7	86	Clear	None
16:45	5	10	150	7.65	0.59	7.53	0.407	4.74	1.66	13.6	81.6	Clear	None
16:50	5	15	150	7.72	0.79	7.53	0.407	4.55	1.66	13.6	76.5	Clear	None
16:55	5	20	150	7.72	0.99	7.52	0.408	4.03	1.54	13.7	73.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-98			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.24	**Total Depth (ft-bmp)**	12	**Water Column (ft)**	5.76	**Gallons in Well**	0.94
Purge Start	12:50	**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:58	**Volumes Purged**	2.13	**Sample ID**	MW-18-98_052323	**Sampled by**	Kaitlyn Hunt
Sample Time	13:50	**Gallons Purged**	2	**Replicate/ Code No.**	DUP-04_052323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	100	7.15	0.13	7.53	1.08	2.8	0.46	13.9	30	Clear	None
13:00	5	5	100	7.59	0.26	7.56	1.07	1.36	0.5	14.2	22.1	Clear	None
13:05	5	10	100	7.94	0.40	7.62	1.05	1.58	2.03	15.2	14.8	Clear	None
13:10	5	15	100	8.08	0.53	7.66	1.03	1.13	0.9	15.2	15.5	Clear	None
13:15	5	20	100	8.24	0.66	7.71	0.97	1.33	2.7	14.8	25.1	Clear	None
13:20	5	25	100	8.42	0.79	7.7	0.95	2.67	1.97	14.6	35.3	Clear	None
13:25	5	30	100	8.59	0.92	7.69	0.95	1.59	2.11	14.6	41.2	Clear	None
13:30	5	35	100	8.74	1.06	7.67	0.95	1.27	1.98	14.9	45.4	Clear	None
13:35	5	40	100	8.94	1.19	7.65	0.95	1.24	1.73	14.4	48.9	Clear	None
13:40	5	45	100	9.12	1.32	7.65	0.95	1	1.46	14.6	50.3	Clear	None
13:45	5	50	100	9.12	1.45	7.63	0.95	1.45	1.42	14.6	51.3	Clear	None
13:50	5	55	100	9.12	1.59	7.63	0.95	1.05	1.42	14.7	51.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-99			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	63.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.20	**Total Depth (ft-bmp)**	14	**Water Column (ft)**	9.80	**Gallons in Well**	1.59
Purge Start	10:58	**Pump Intake (ft-bmp)**	12.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:35	**Volumes Purged**	1.57	**Sample ID**	MW-18-99_052323	**Sampled by**	Kaitlyn Hunt
Sample Time	12:30	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:00	0	0	100	4.84	0.05	7.78	1.3	3.86	0.57	15	149.4	Clear	None
11:05	5	5	100	5.25	0.18	7.79	1.31	1.87	0.22	14.9	135.4	Clear	None
11:10	5	10	100	5.60	0.32	7.8	1.31	2.4	0.13	15	106.2	Clear	None
11:15	5	15	100	5.79	0.45	7.86	1.28	3.14	0.13	15	78.5	Clear	None
11:20	5	20	100	6.04	0.58	7.99	1.2	0.73	0.14	14.9	72.3	Clear	None
11:25	5	25	100	6.21	0.71	7.99	1.15	1.88	0.13	14.4	59.8	Clear	None
11:30	5	30	100	6.39	0.85	8.01	1.13	1.53	0.16	14.7	10.1	Clear	None
11:35	5	35	100	6.40	0.98	8.01	1.12	1.63	0.18	14.6	-15.3	Clear	None
11:40	5	40	100	6.38	1.11	8.03	1.11	0.9	0.18	15.2	-54.8	Clear	None
11:45	5	45	100	6.38	1.24	8.06	1.09	2.51	0.15	14.7	-84.9	Clear	None
11:50	5	50	100	6.38	1.37	8.07	1.03	1.46	0.2	14.8	-103.9	Clear	None
11:55	5	55	100	6.38	1.51	8.11	1.01	0.8	0.22	14.7	-118	Clear	None
12:00	5	60	100	6.38	1.64	8.15	0.93	1.27	0.22	14.7	-127	Clear	None
12:05	5	65	100	6.38	1.77	8.2	0.91	1.19	0.28	14.5	-132.5	Clear	None
12:10	5	70	100	6.38	1.85	8.25	0.9	1.09	0.27	14.9	-133.5	Clear	None
12:15	5	75	100	6.38	1.98	8.27	0.88	1.44	0.22	14.5	-131.9	Clear	None
12:20	5	80	100	6.38	2.11	8.32	0.88	1.13	0.31	14.7	-132.1	Clear	None
12:25	5	85	100	6.38	2.25	8.33	0.88	0.59	0.33	14.4	-129.3	Clear	None
12:30	5	90	100	6.38	2.38	8.44	0.89	2.95	0.33	14.7	-132	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Well did not stabilize

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-100			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.57	**Total Depth (ft-bmp)**	13	**Water Column (ft)**	2.43	**Gallons in Well**	0.39
Purge Start	09:18	**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:10	**Volumes Purged**	3.85	**Sample ID**	MW-18-100_052323	**Sampled by**	Kaitlyn Hunt
Sample Time	10:05	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:20	0	0	100	10.57	0.05	7.21	1.32	16.1	3.26	11.9	184.4	Clear	None
09:25	5	5	150	11.09	0.25	7.53	1.28	9.23	3.13	11.8	173.9	Clear	None
09:30	5	10	150	11.35	0.45	7.57	1.26	2.61	3.09	11.9	164.3	Clear	None
09:35	5	15	100	11.50	0.58	7.56	1.21	1.26	3.93	12.3	156.7	Clear	None
09:40	5	20	100	11.66	0.71	7.56	1.17	1.27	3.88	12.3	151.7	Clear	None
09:45	5	25	100	11.86	0.85	7.56	1.14	0.24	3.78	12.3	147.3	Clear	None
09:50	5	30	100	11.98	0.98	7.56	1.11	0.27	3.83	12.3	143.4	Clear	None
09:55	5	35	100	12.17	1.11	7.55	1.09	0.32	3.72	12.4	135.8	Clear	None
10:00	5	40	100	12.27	1.24	7.54	1.08	0.72	3.59	12.4	131.5	Clear	None
10:05	5	45	100	12.33	1.37	7.54	1.07	0.43	3.62	12.4	128.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Specific conductivity measured

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-101			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	76 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.26	**Total Depth (ft-bmp)**	86.6	**Water Column (ft)**	24.34	**Gallons in Well**	3.96
Purge Start	13:20	**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:45	**Volumes Purged**	0.25	**Sample ID**	MW-18-101_052323	**Sampled by**	Anyssa Mandich
Sample Time	13:45	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:25	0	0	125	62.74	0.17	7.1	1.38	13.4	0.52	15.3	-187.1	Clear	Medium
13:30	5	5	125	62.78	0.33	7.06	1.52	37	0.22	15.1	-229.9	Clear	Medium
13:35	5	10	125	62.78	0.50	7.05	1.71	39.8	0.15	15.1	-248.6	Clear	Medium
13:40	5	15	125	62.82	0.66	6.96	1.75	40.3	0.15	15.1	-249.9	Clear	Medium
13:45	5	20	125	62.82	0.83	6.95	1.75	41	0.15	15.1	-245.1	Clear	Medium

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-105			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	63 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.61	**Total Depth (ft-bmp)**	11.17	**Water Column (ft)**	9.56	**Gallons in Well**	1.55
Purge Start	17:00	**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:35	**Volumes Purged**	1.29	**Sample ID**	MW-18-105_052423	**Sampled by**	Anyssa Mandich
Sample Time	17:35	**Gallons Purged**	2	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
17:05	0	0	150	2.45	0.20	7.32	0.418	24.3	0.3	10.1	70.5	Clear	None
17:10	5	5	150	2.68	0.40	7.32	0.416	22.3	0.25	10.1	68.5	Clear	None
17:15	5	10	150	2.84	0.59	7.31	0.413	7.71	0.3	10	66.3	Clear	None
17:20	5	15	150	3.08	0.79	7.31	0.412	6.2	0.35	10.1	64	Clear	None
17:25	5	20	150	3.39	0.99	7.32	0.412	3.21	0.32	10.1	61.3	Clear	None
17:30	5	25	150	3.65	1.19	7.31	0.412	4.02	0.3	10	59.8	Clear	None
17:35	5	30	150	3.86	1.39	7.31	0.412	3.87	0.32	9.9	56	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site P3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-107			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	63 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.10	**Total Depth (ft-bmp)**	29.82	**Water Column (ft)**	11.72	**Gallons in Well**	1.90
Purge Start	15:50	**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:35	**Volumes Purged**	1.32	**Sample ID**	MW-19-107_052423	**Sampled by**	Anyssa Mandich
Sample Time	16:35	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:55	0	0	150	18.58	0.20	6.85	0.79	633	0.54	11.8	77	Clear	None
16:00	5	5	150	18.73	0.40	6.84	0.78	417	0.43	11.8	63.5	Clear	None
16:05	5	10	150	18.88	0.59	6.84	0.77	325	0.44	11.7	49.6	Clear	None
16:10	5	15	150	18.97	0.79	6.84	0.78	270	0.42	11.9	32.5	Clear	None
16:15	5	20	150	19.03	0.99	6.84	0.78	224	0.43	11.9	21.5	Clear	None
16:20	5	25	150	19.10	1.19	6.84	0.78	187	0.41	11.9	13	Clear	None
16:25	5	30	150	19.16	1.39	6.84	0.77	150	0.4	11.6	-3.4	Clear	None
16:30	5	35	150	19.22	1.59	6.84	0.77	137	0.37	11.6	-6.5	Clear	None
16:35	5	40	150	19.22	1.78	6.84	0.77	140	0.37	11.7	-10.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Berm is overgrown with grass/tripping hazards

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-108			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	63 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.07	**Total Depth (ft-bmp)**	30	**Water Column (ft)**	13.93	**Gallons in Well**	2.26
Purge Start	14:45	**Pump Intake (ft-bmp)**	25.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:30	**Volumes Purged**	1.11	**Sample ID**	MW-19-108_052423	**Sampled by**	Anyssa Mandich
Sample Time	15:30	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	150	16.18	0.20	6.76	1.22	186	0.92	11.3	101	Clear	None
14:55	5	5	150	16.18	0.40	6.75	1.21	174	0.85	11.2	82.7	Clear	None
15:00	5	10	150	16.22	0.59	6.75	1.21	187	0.98	11.2	66.4	Clear	None
15:05	5	15	150	16.23	0.79	6.75	1.21	155	0.97	11.2	52.9	Clear	None
15:10	5	20	150	16.23	0.99	6.75	1.21	149	1	11.2	45.2	Clear	None
15:15	5	25	150	16.23	1.19	6.75	1.2	121	0.98	11.1	36	Clear	None
15:20	5	30	150	16.23	1.39	6.75	1.2	36.5	0.91	11.1	30.5	Clear	None
15:25	5	35	150	16.23	1.59	6.75	1.2	34.6	0.9	11.1	26.7	Clear	None
15:30	5	40	150	16.23	1.78	6.75	1.2	33.8	0.88	11.1	20.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Tripping hazards due to tall grass and holes in berm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-111			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	63 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.88	**Total Depth (ft-bmp)**	27.36	**Water Column (ft)**	4.48	**Gallons in Well**	0.73
Purge Start	13:50	**Pump Intake (ft-bmp)**	26	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:20	**Volumes Purged**	1.37	**Sample ID**	MW-19-111_052423	**Sampled by**	Anyssa Mandich
Sample Time	14:20	**Gallons Purged**	1	**Replicate/ Code No.**	MW-19-111_052423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:55	0	0	125	23.01	0.17	6.8	1.27	2.33	2.23	13.2	46.3	Clear	None
14:00	5	5	125	23.03	0.33	6.77	1.25		1.83	12.4	51.4	Clear	None
14:05	5	10	125	23.03	0.50	6.78	1.24	2.68	1.81	12.2	55.2	Clear	None
14:10	5	15	125	23.03	0.66	6.78	1.23	2.96	1.72	11.9	58.9	Clear	None
14:15	5	20	125	23.03	0.83	6.78	1.22	2.6	1.71	11.8	60.4	Clear	None
14:20	5	25	125	23.03	0.99	6.78	1.22	2.02	1.66	11.8	62.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	6	None

Comments: Tall grass/tripping hazards on berm
MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-115			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.0 degrees F and Clear. The wind is blowing E at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.62	**Total Depth (ft-bmp)**	81.5	**Water Column (ft)**	21.88	**Gallons in Well**	3.56
Purge Start	13:30	**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:10	**Volumes Purged**	0.59	**Sample ID**	MW-19-115_051723	**Sampled by**	Austin Westhuis
Sample Time	14:10	**Gallons Purged**	2.11	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:35	0	0	200	60.88	0.26	7.74	2.38	239	10.23	14.1	29.9	Clear	None
13:40	5	5	200	60.92	0.53	7.35	2.39	188	8.45	14.1	35	Clear	None
13:45	5	10	200	60.98	0.79	7.23	2.4	132	6.12	14.1	30.1	Clear	None
13:50	5	15	200	60.99	1.06	7.12	2.41	109	5.8	14.2	27.2	Clear	None
13:55	5	20	200	60.99	1.32	7.09	2.43	96.4	5.65	14.1	22.4	Clear	None
14:00	5	25	200	60.99	1.59	7.08	2.42	91.6	5.59	14.1	21.1	Clear	None
14:05	5	30	200	60.99	1.85	7.06	2.46	88.4	5.57	14.1	19.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-116			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing NE at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.13	**Total Depth (ft-bmp)**	74.2	**Water Column (ft)**	18.07	**Gallons in Well**	2.94
Purge Start	14:55	**Pump Intake (ft-bmp)**	71.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:30	**Volumes Purged**	0.63	**Sample ID**	MW-19-116_051723	**Sampled by**	Austin Westhuis
Sample Time	15:25	**Gallons Purged**	1.85	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:00	0	0	200	56.70	0.26	7.05	1.13	143	5.27	14.4	-31.5	Clear	None
15:05	5	5	200	56.75	0.53	6.98	1.14	44.1	4.41	14.4	-33.8	Clear	None
15:10	5	10	200	56.75	0.79	6.94	1.14	11.2	3.28	14.4	-40.7	Clear	None
15:15	5	15	200	56.75	1.06	6.92	1.14	4.21	2.06	14.4	-46	Clear	None
15:20	5	20	200	56.75	1.32	6.93	1.13	3.98	2.01	14.5	-48.5	Clear	None
15:25	5	25	200	56.77	1.59	6.93	1.15	3.69	1.91	14.5	-50.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-117			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	59.0 degrees F and Clear. The wind is blowing S/SE at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.92	**Total Depth (ft-bmp)**	62.8	**Water Column (ft)**	3.88	**Gallons in Well**	0.63
Purge Start	13:10	**Pump Intake (ft-bmp)**	62.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:55	**Volumes Purged**	1.89	**Sample ID**	MW-19-117_051823	**Sampled by**	Billy Cobern
Sample Time	13:55	**Gallons Purged**	1.19	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	100	59.00	0.13	6.99	1.17	595	2.09	17.1	-53.8	Clear	None
13:20	5	5	100	59.15	0.26	6.98	1.16	124	1.43	16.9	-64.8	Clear	None
13:25	5	10	100	59.32	0.40	6.99	1.16	136	0.88	17.2	-70.7	Clear	None
13:30	5	15	100	59.47	0.53	6.96	1.15	64.3	0.48	16.8	-74.5	Clear	None
13:35	5	20	100	59.55	0.66	6.95	1.15	58.3	0.39	16.9	-76.9	Clear	None
13:40	5	25	100	59.61	0.79	6.94	1.15	52.1	0.36	17.1	-78.5	Clear	None
13:45	5	30	100	59.69	0.66	6.94	1.15	59.2	0.37	17	-79.3	Clear	None
13:50	5	35	100	59.75	1.06	6.94	1.15	61.3	0.35	17	-79.3	Clear	None
13:55	5	40	100	59.75	1.19	6.94	1.15	60.6	0.36	17	-79.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-120			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.0 degrees F and Clear. The wind is blowing SE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.60	**Total Depth (ft-bmp)**	74	**Water Column (ft)**	8.40	**Gallons in Well**	1.36
Purge Start	12:00	**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:40	**Volumes Purged**	0.78	**Sample ID**	MW-19-120_051823	**Sampled by**	Billy Cobern
Sample Time	12:40	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	100	65.80	0.13	7.01	2.83	112	1.17	17.8	4	Orange	None
12:10	5	5	100	65.93	0.26	7.03	2.92	302	0.48	17.2	-19.9	Orange	None
12:15	5	10	100	66.03	0.40	7.03	2.88	356	0.4	18.6	-26.1	Orange	None
12:20	5	15	100	66.13	0.53	7.03	2.89	394	0.53	17.5	-23.2	Orange	None
12:25	5	20	100	66.23	0.66	7.03	2.89	305	0.53	17.2	-18.6	Orange	None
12:30	5	25	100	66.32	0.79	7.03	2.89	222	0.49	17.2	-12	Orange	None
12:35	5	30	100	66.37	0.92	7.03	2.89	204	0.49	17.3	-7.5	Orange	None
12:40	5	35	100	66.40	1.06	7.03	2.89	201	0.5	17.2	-5.1	Orange	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-121			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	48.9 degrees F and Clear. The wind is blowing NE at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.64	**Total Depth (ft-bmp)**	71.15	**Water Column (ft)**	6.51	**Gallons in Well**	1.06
Purge Start	10:15	**Pump Intake (ft-bmp)**	69	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:50	**Volumes Purged**	0.87	**Sample ID**	MW-19-121_051723	**Sampled by**	Billy Cobern
Sample Time	10:50	**Gallons Purged**	0.92	**Replicate/ Code No.**	DUP-02_051723	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	100	64.95	0.13	6.98	2.26	21.1	4.43	13.2	226	Clear	None
10:25	5	5	100	64.95	0.26	6.98	2.26	16.6	4.44	13.3	227.4	Clear	None
10:30	5	10	100	64.95	0.40	6.97	2.27	19.2	4.1	13.4	236.7	Clear	None
10:35	5	15	100	64.95	0.53	6.97	2.27	24.3	4.11	13.6	240.2	Clear	None
10:40	5	20	100	64.95	0.66	6.97	2.27	28.7	4.32	13.4	243.8	Clear	None
10:45	5	25	100	64.95	0.79	6.97	2.26	29.8	4.26	13.5	245.9	Clear	None
10:50	5	30	100	64.95	0.92	6.97	2.26	30.2	4.29	13.6	246.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Total Phosphorus/TKN	250 mL Plastic	2	H2SO4
Nitrate	125 mL Plastic	2	None
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-122			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.9 degrees F and Clear. The wind is blowing S/SE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.29	**Total Depth (ft-bmp)**	66.85	**Water Column (ft)**	3.56	**Gallons in Well**	0.58
Purge Start	09:45	**Pump Intake (ft-bmp)**	66	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:15	**Volumes Purged**	1.36	**Sample ID**	MW-19-122_051823	**Sampled by**	Billy Cobern
Sample Time	10:15	**Gallons Purged**	0.79	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:50	0	0	100	63.35	0.13	7.22	4.11	873	8.19	14	163	Brown	None
09:55	5	5	100	63.40	0.26	7.19	4.15	684	7.75	14.1	162.7	Brown	None
10:00	5	10	100	63.45	0.40	7.17	4.17	549	7.31	14.1	162.3	Brown	None
10:05	5	15	100	63.45	0.53	7.15	4.17	616	6.89	14	164	Brown	None
10:10	5	20	100	63.45	0.66	7.14	4.17	591	7.05	13.9	166.7	Brown	None
10:15	5	25	100	63.45	0.79	7.15	4.17	588	6.57	13.9	169	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-19-123	**Date(s):**	2023-05-17	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:45.03 °F, rH:72%, Clouds: 0%, Wind:6.91mph NE			**Field Technician:**		Billy Cobern	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	62.58	**Total Depth (ft-bmp):**	73.8	**Water Column(ft):**	11.22	**Gallons in Well:**	1.7952
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	71	**Purge Method:**	Low Flow	**Purging Equipment:**	Disposable bladder
Purge Start Time:	08:55	**Total Volume Purged (milliliters):**	3000	**Sample ID:**	MW-19-123_051723	**Sample Time:**	09:25
Purge End Time:	09:25	**Well Volumes Purged (total):**	0.44	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	YSI ProPlus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:00	0	100	mL/min	62.58	7.77	1.16	36.3	9.7	12.7	245.1	Clear	No Odor
09:05	5	100	mL/min	62.88	7.51	2.27	26.3	10.8	12.5	253.5	Clear	No Odor
09:10	10	100	mL/min	62.88	7.47	2.23	21.2	10.88	12.4	254.4	Clear	No Odor
09:15	15	100	mL/min	62.88	7.27	2.27	16.7	10.63	12.2	260.1	Clear	No Odor
09:20	20	100	mL/min	62.88	7.23	2.27	15.4	9.97	12	262.1	Clear	No Odor
09:25	25	100	mL/min	62.88	7.22	2.27	15.4	10.19	12	262.4	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4-D	Clear Glass	3	HCl
Total P, TKN	250 mL Plastic	1	H2SO4
Nitrogen, Nitrate-Nitrite	125 mL Plastic	1	None

Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-124			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	51.1 degrees F and Clear. The wind is blowing S/SE at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.67	**Total Depth (ft-bmp)**	72.3	**Water Column (ft)**	7.63	**Gallons in Well**	1.24
Purge Start	10:45	**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:30	**Volumes Purged**	0.96	**Sample ID**	MW-19-124_051823	**Sampled by**	Billy Cobern
Sample Time	11:30	**Gallons Purged**	1.19	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:50	0	0	100	64.74	0.13	6.73	3.5	39.6	1.5	14.6	-42.7	Clear	None
10:55	5	5	100	64.74	0.26	6.69	3.51	346	0.45	14.9	-59.5	Clear	None
11:00	5	10	100	64.74	0.40	6.69	3.51	306	0.31	14.9	-65.1	Clear	None
11:05	5	15	100	64.74	0.53	6.68	3.52	268	0.26	15	-80.3	Clear	None
11:10	5	20	100	64.74	0.66	6.68	3.51	187	0.26	15	-70.6	Clear	None
11:15	5	25	100	64.74	0.79	6.68	3.52	95.6	0.25	15	-73.7	Clear	None
11:20	5	30	100	64.74	0.92	6.67	3.52	60.1	0.25	15.1	-75.6	Clear	None
11:25	5	35	100	64.74	1.06	6.67	3.52	58.1	0.24	15.1	-76.4	Clear	None
11:30	5	40	100	64.74	1.19	6.67	3.52	54.6	0.24	15.2	-76.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-126			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	64.9 degrees F and Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.02	**Total Depth (ft-bmp)**	74.45	**Water Column (ft)**	15.43	**Gallons in Well**	2.51
Purge Start	15:30	**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:10	**Volumes Purged**	0.42	**Sample ID**	MW-20-126_051823	**Sampled by**	Billy Cobern
Sample Time	16:10	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:35	0	0	100	59.32	0.13	7	4.14	54	6.5	15.2	145.2	Clear	None
15:40	5	5	100	59.32	0.26	6.98	4.17	45.3	5.53	14.9	137.4	Clear	None
15:45	5	10	100	59.32	0.40	6.98	4.18	40.2	4.93	14.7	130.4	Clear	None
15:50	5	15	100	59.32	0.53	6.97	4.17	34.1	4.63	14.5	124.7	Clear	None
15:55	5	20	100	59.32	0.66	6.97	4.18	31.7	4.5	14.5	120	Clear	None
16:00	5	25	100	59.32	0.79	6.96	4.19	27.8	4.37	14.5	115.3	Clear	None
16:05	5	30	100	59.32	0.92	6.97	4.19	26.8	3.99	14.5	112.8	Clear	None
16:10	5	35	100	59.32	1.06	6.97	4.19	25.4	4.06	14.8	109.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Well is bubbling

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-127			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.0 degrees F and Clear. The wind is blowing E at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.01	**Total Depth (ft-bmp)**	78.65	**Water Column (ft)**	13.64	**Gallons in Well**	2.22
Purge Start	14:00	**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:40	**Volumes Purged**	0.48	**Sample ID**	MW-20-127_051723	**Sampled by**	Billy Cobern
Sample Time	14:40	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:05	0	0	100	65.05	0.13	7.15	1.67	146	7.01	17.5	169.8	Clear	None
14:10	5	5	100	65.21	0.26	6.81	3.35	123	3.6	16.6	67.1	Clear	None
14:15	5	10	100	65.29	0.40	6.73	3.39	104	1.27	15	29.7	Clear	None
14:20	5	15	100	65.29	0.53	6.73	3.38	34.1	0.89	14.8	13.1	Clear	None
14:25	5	20	100	65.29	0.66	6.72	3.38	19.2	0.81	15.1	8.4	Clear	None
14:30	5	25	100	65.29	0.79	6.72	3.38	9.71	0.7	14.8	3.8	Clear	None
14:35	5	30	100	65.29	0.92	6.72	3.38	9.23	0.66	14.8	3	Clear	None
14:40	5	35	100	65.29	1.06	6.72	3.38	9.07	0.72	14.9	3.2	Clear	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
TKN/Phosphorus	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-128			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Clear. The wind is blowing E/NE at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.78	**Total Depth (ft-bmp)**	70.15	**Water Column (ft)**	2.37	**Gallons in Well**	0.39
Purge Start	12:50	**Pump Intake (ft-bmp)**	69.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:30	**Volumes Purged**	2.72	**Sample ID**	MW-20-128_051723	**Sampled by**	Billy Cobern
Sample Time	13:30	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	100	67.85	0.13	7.78	3.36	1000	9.01	18.6	220.5	Brown	None
13:00	5	5	100	67.85	0.26	7.77	3.37	1000	8.61	18.1	224.3	Brown	None
13:05	5	10	100	67.85	0.40	7.78	3.4	1000	7.94	16.8	231.9	Brown	None
13:10	5	15	100	67.85	0.53	7.67	3.42	642	7.32	16.3	233.7	Brown	None
13:15	5	20	100	67.85	0.66	7.64	3.41	456	7.45	16.4	237	Brown	None
13:20	5	25	100	67.85	0.79	7.59	3.42	423	7.49	16.4	242.7	Brown	None
13:25	5	30	100	67.85	0.92	7.6	3.41	409	7.96	16.2	244	Brown	None
13:30	5	35	100	67.85	1.06	7.62	3.41	398	7.58	16.2	243.6	Brown	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
TKN/Phosphorus	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-129			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.88	**Total Depth (ft-bmp)**	70.98	**Water Column (ft)**	11.10	**Gallons in Well**	1.80
Purge Start	08:35	**Pump Intake (ft-bmp)**	68.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:35	**Volumes Purged**	1.61	**Sample ID**	MW-20-129_051823	**Sampled by**	Donald Richmond
Sample Time	09:35	**Gallons Purged**	2.9	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:45	0	0	200	59.88	0.53	6.72	0.92	22.5	3.8	12.6	98.6	Clear	None
08:50	5	5	200	59.88	0.79	6.55	1.02	19	1.35	12.6	95.4	Clear	None
08:55	5	10	200	59.88	1.06	6.53	1.19	18.9	0.49	12.5	90.1	Clear	None
09:00	5	15	200	59.88	1.32	6.68	1.8	39.2	0.25	12.5	83.9	Clear	None
09:05	5	20	200	59.88	1.59	6.75	1.91	25.4	0.2	12.4	76.8	Clear	None
09:10	5	25	200	59.88	1.85	6.78	1.97	13	0.19	12.3	70.3	Clear	None
09:15	5	30	200	59.88	2.11	6.81	1.99	6.97	0.16	12.3	61.8	Clear	None
09:20	5	35	200	59.88	2.38	6.82	1.99	3.9	0.18	12.2	58.1	Clear	None
09:25	5	40	200	59.88	2.64	6.82	1.97	2.8	0.23	12	54	Clear	None
09:30	5	45	200	59.88	2.91	6.83	1.98	3.06	0.21	12.1	48.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-130			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	46.9 degrees F and Clear. The wind is blowing S/SE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.76	**Total Depth (ft-bmp)**	69.75	**Water Column (ft)**	2.99	**Gallons in Well**	0.49
Purge Start	09:30	**Pump Intake (ft-bmp)**	68.75	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:10	**Volumes Purged**	4.31	**Sample ID**	MW-20-130_051823	**Sampled by**	Austin Westhuis
Sample Time	10:05	**Gallons Purged**	2.11	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	200	66.76	0.26	6.76	1.21	212	3.29	13.4	-51.5	Clear	None
09:40	5	5	200	66.76	0.53	6.73	1.2	101	3.31	13.5	-54.5	Clear	None
09:45	5	10	200	66.76	0.79	6.74	1.18	22.6	1.91	13.6	-57.2	Clear	None
09:50	5	15	200	66.76	1.06	6.74	1.17	5.61	1.96	13.6	-55.7	Clear	None
09:55	5	20	200	66.76	1.32	6.75	1.16	2.22	1.91	13.6	-57.9	Clear	None
10:00	5	25	200	66.76	1.59	6.76	1.14	1.99	1.86	13.6	-51.9	Clear	None
10:05	5	30	200	66.76	1.85	6.76	1.13	1.38	1.81	13.6	-57.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8260B-SIMS	40 mL Glass	3	HCL
PFAS	125 mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-131			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	77.0 degrees F and Clear. The wind is blowing W at 4.7 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.18	**Total Depth (ft-bmp)**	10	**Water Column (ft)**	4.82	**Gallons in Well**	0.78
Purge Start	14:45	**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:40	**Volumes Purged**	1.92	**Sample ID**	MW-20-131_052323	**Sampled by**	Kaitlyn Hunt
Sample Time	15:35	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	100	5.50	0.13	7.14	3.72	4.84	0.22	14.3	82.4	Clear	None
14:55	5	5	100	5.50	0.26	7.16	3.75	3.38	0.15	14.2	43.9	Clear	None
15:00	5	10	100	5.55	0.40	7.16	3.74	3.66	0.17	14.2	27.8	Clear	None
15:05	5	15	100	5.60	0.53	7.16	3.74	2.86	0.22	14.2	21.5	Clear	None
15:10	5	20	100	5.61	0.66	7.16	3.76	2.63	0.34	14.3	15.2	Clear	None
15:15	5	25	100	5.61	0.79	7.16	3.74	2.74	0.36	14.3	11.4	Clear	None
15:20	5	30	100	5.61	0.92	7.16	3.74	3.12	0.38	14.3	9.2	Clear	None
15:25	5	35	100	5.61	1.06	7.17	3.71	1.4	0.4	14.1	7.9	Clear	None
15:30	5	40	100	5.61	1.19	7.17	3.68	2.06	0.41	13.9	6.5	Clear	None
15:35	5	45	100	5.61	1.32	7.17	3.66	1.84	0.4	13.9	4.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-132			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	81.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.35	**Total Depth (ft-bmp)**	11	**Water Column (ft)**	5.65	**Gallons in Well**	0.92
Purge Start	16:08	**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:15	**Volumes Purged**	1.78	**Sample ID**	MW-20-132_052323	**Sampled by**	Kaitlyn Hunt
Sample Time	17:10	**Gallons Purged**	1.64	**Replicate/ Code No.**	DUP-07_052323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:10	0	0	100	5.50	0.05	7.22	2.23	39.6	0.69	13.2	-10.3	Clear	None
16:15	5	5	100	5.52	0.18	7.25	2.14	15.5	0.37	13.2	-31.4	Clear	None
16:20	5	10	100	5.55	0.32	7.27	1.94	12.3	0.33	13.1	-45.3	Clear	None
16:25	5	15	100	5.57	0.45	7.28	1.74	10.9	0.29	13	-56.2	Clear	None
16:30	5	20	100	5.60	0.58	7.27	1.64	7.09	0.3	12.9	-67.7	Clear	None
16:35	5	25	100	5.60	0.71	7.26	1.58	5.01	0.3	12.7	-76.2	Clear	None
16:40	5	30	100	5.60	0.85	7.26	1.56	3.66	0.3	12.5	-83.9	Clear	None
16:45	5	35	100	5.60	0.98	7.26	1.63	3.63	0.31	12.4	-90.6	Clear	None
16:50	5	40	100	5.60	1.11	7.25	1.64	1.96	0.3	12.5	-94.9	Clear	None
16:55	5	45	100	5.60	1.24	7.25	1.69	2.11	0.31	12.6	-98	Clear	None
17:00	5	50	100	5.60	1.37	7.25	1.72	1.68	0.31	12.2	-100.4	Clear	None
17:05	5	55	100	5.60	1.51	7.25	1.76	1.64	0.3	12.4	-102.3	Clear	None
17:10	5	60	100	5.60	1.64	7.25	1.81	1.91	0.3	12.4	-104.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition,Cracked well pad
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-133			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	60.1 degrees F and Mostly Cloudy. The wind is blowing NE at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.18	**Total Depth (ft-bmp)**	15	**Water Column (ft)**	5.82	**Gallons in Well**	0.95
Purge Start	10:40	**Pump Intake (ft-bmp)**	14	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:30	**Volumes Purged**	1.58	**Sample ID**	MW-21-133_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	11:25	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:00	0	0	100	11.05	0.53	7.09	0.65	2.67	0.38	11.4	101.8	Clear	None
11:05	5	5	100	11.09	0.66	7.09	0.66	2.08	0.32	11.4	99.2	Clear	None
11:10	5	10	100	11.13	0.79	7.08	0.66	1.64	0.43	11.3	97.5	Clear	None
11:15	5	15	100	11.20	0.92	7.08	0.65	1.36	0.38	11.3	94.1	Clear	None
11:20	5	20	100	11.27	1.06	7.08	0.65	1.55	0.39	11.3	92.4	Clear	None
11:25	5	25	100	11.27	1.19	7.08	0.65	0.88	0.37	11.2	90.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments: Tablet deleted readings before 1100

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-134			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	It is Clear. The wind is blowing N/NE at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.28	**Total Depth (ft-bmp)**	16	**Water Column (ft)**	6.72	**Gallons in Well**	1.09
Purge Start	09:13	**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:10	**Volumes Purged**	1.38	**Sample ID**	MW-21-134_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	10:05	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	100	9.95	0.05	7.11	0.61	5.2	2.02	11.6	40.7	Clear	None
09:20	5	5	100	10.42	0.18	7.12	0.61	5.37	1.78	11.5	45.6	Clear	None
09:25	5	10	100	10.88	0.32	7.14	0.61	6	1.56	11.4	53.8	Clear	None
09:30	5	15	100	10.98	0.45	7.14	0.61	3.15	1.48	11.4	55.3	Clear	None
09:35	5	20	100	11.22	0.58	7.15	0.6	3.72	1.62	11.5	60.6	Clear	None
09:40	5	25	100	11.42	0.71	7.16	0.59	3.11	2.05	11.4	67.3	Clear	None
09:45	5	30	100	11.57	0.85	7.17	0.56	3.3	2.34	11.2	75.2	Clear	None
09:50	5	35	100	11.70	0.98	7.18	0.55	3.1	2.67	11.1	81.8	Clear	None
09:55	5	40	100	11.85	1.11	7.16	0.55	0.82	2.64	11	86.2	Clear	None
10:00	5	45	100	11.85	1.24	7.17	0.55	0.29	2.5	11	88.4	Clear	None
10:05	5	50	100	11.85	1.37	7.17	0.56	1.24	2.6	11	89.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-135			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	53.1 degrees F and Fog/Mist. The wind is blowing N at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.11	**Total Depth (ft-bmp)**	27	**Water Column (ft)**	1.89	**Gallons in Well**	0.31
Purge Start	08:05	**Pump Intake (ft-bmp)**	26	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:02	**Volumes Purged**	4.84	**Sample ID**	MW-21-135_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	08:50	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:10	0	0	100	26.11	0.13	7.66	0.74	17	2.15	12	185.3	Clear	None
08:15	5	5	100	26.53	0.26	7.71	0.71	9.03	2.13	12.4	159.3	Clear	None
08:20	5	10	100	26.53	0.40	7.67	0.7	8.13	2.04	12.4	132.7	Clear	None
08:25	5	15	100	26.80	0.53	7.64	0.7	7.13	1.99	12.5	50	Clear	None
08:30	5	20	100	26.90	0.66	7.58	0.7	6.29	1.98	12.7	-17.7	Clear	None
08:35	5	25	100	26.94	0.79	7.58	0.7	4.75	1.97	12.6	-40.3	Clear	None
08:40	5	30	100	26.97	0.92	7.53	0.7	3.6	1.84	12.6	-46.9	Clear	None
08:45	5	35	100	26.99	1.06	7.49	0.7	3.46	1.73	12.6	-52.9	Clear	None
08:50	5	40	100	27.04	1.19	7.44	0.7	2.92	1.69	12.6	-55.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-21-139	**Date(s):**	2023-05-16	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:74.34 °F, rH:36%, Clouds: 0%, Wind:13.8mph W-SW			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	3.07	**Total Depth (ft-bmp):**	15.35	**Water Column(ft):**	12.28	**Gallons in Well:**	1.9648
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	13:50	**Total Volume Purged (milliliters):**	5000	**Sample ID:**	MW-21-139_051623	**Sample Time:**	14:20
Purge End Time:	14:15	**Well Volumes Purged (total):**	0.67	**Replicate Type / Replicate ID:**	**Duplicate** / DUP-01_051623	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:55	0	200	mL/min	3.07	7.74	1.48	2.55	0.25	13.8	159.3	Clear	No Odor
14:00	5	200	mL/min	4.65	7.7	1.43	0.86	0.19	13.6	147	Clear	No Odor
14:05	10	200	mL/min	4.84	7.67	1.4	1.53	0.14	13.6	137.5	Clear	No Odor
14:10	15	200	mL/min	4.95	7.67	1.41	1.39	0.12	13.5	133.7	Clear	No Odor
14:15	20	200	mL/min	5.03	7.66	1.41	1.18	0.13	13.4	130.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4-D	Clear Glass	3	HCl
PFASs (E537)	HDPE Plastic	2	None

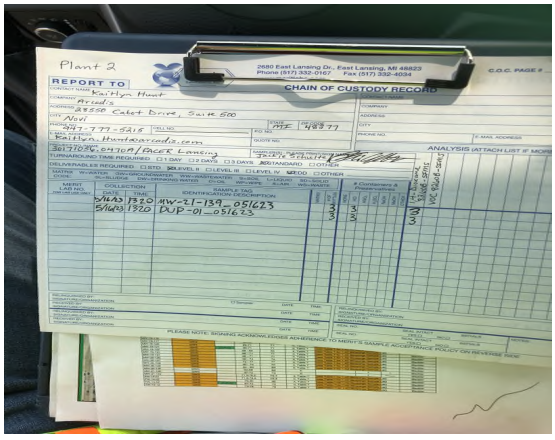
Comments: None

Well Information:

Well Labeled Properly: NA

Is Well in Good Condition? NA

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-140			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	44.1 degrees F and Clear. The wind is blowing S/SE at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.25	**Total Depth (ft-bmp)**	76	**Water Column (ft)**	7.75	**Gallons in Well**	1.26
Purge Start	08:30	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:15	**Volumes Purged**	0.94	**Sample ID**	MW-21-140_051823	**Sampled by**	Billy Cobern
Sample Time	09:15	**Gallons Purged**	1.19	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:35	0	0	100	68.32	0.13	7.18	0.84	194	9.88	12.4	42.7	Clear	None
08:40	5	5	100	68.32	0.26	7.16	0.84	127	9.8	12.2	41.5	Clear	None
08:45	5	10	100	68.32	0.40	7.15	0.84	96.3	9.76	12	40.4	Clear	None
08:50	5	15	100	68.32	0.53	7.14	0.84	76.8	9.61	11.9	34.3	Clear	None
08:55	5	20	100	68.32	0.66	7.14	0.84	53.6	9.42	11.8	25.2	Clear	None
09:00	5	25	100	68.32	0.79	7.14	0.83	26.7	9.19	11.8	16.8	Clear	None
09:05	5	30	100	68.32	0.92	7.14	0.83	19.8	9.03	11.6	8.4	Clear	None
09:10	5	35	100	68.32	1.06	7.13	0.83	19.1	9.01	11.6	8	Clear	None
09:15	5	40	100	68.32	1.19	7.14	0.83	18.8	8.95	11.6	7.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-141			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	55.0 degrees F and Clear. The wind is blowing SE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	76.20	**Total Depth (ft-bmp)**	79.7	**Water Column (ft)**	3.50	**Gallons in Well**	0.57
Purge Start	11:50	**Pump Intake (ft-bmp)**	78.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:30	**Volumes Purged**	3.70	**Sample ID**	MW-21-141_051823	**Sampled by**	Austin Westhuis
Sample Time	12:25	**Gallons Purged**	2.11	**Replicate/ Code No.**	MW-21-141_051823	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:55	0	0	200	76.20	0.26	6.56	0.77	36.8	0.78	13.5	-17.4	Clear	None
12:00	5	5	200	76.20	0.53	6.61	0.78	15.6	0.78	13.7	-26.6	Clear	None
12:05	5	10	200	76.20	0.79	6.61	0.77	3.44	0.45	13.6	-57.2	Clear	None
12:10	5	15	200	76.20	1.06	6.65	0.76	3.02	0.37	13.6	-90.4	Clear	None
12:15	5	20	200	76.20	1.32	6.66	0.76	2.53	0.34	13.7	-86.6	Clear	None
12:20	5	25	200	76.20	1.59	6.67	0.74	2.09	0.33	13.6	-85.1	Clear	None
12:25	5	30	200	76.20	1.85	6.67	0.74	1.79	0.31	13.5	-81.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-142			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.09	**Total Depth (ft-bmp)**	79.16	**Water Column (ft)**	14.07	**Gallons in Well**	2.29
Purge Start	11:10	**Pump Intake (ft-bmp)**	76.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:10	**Volumes Purged**	1.27	**Sample ID**	MW-21-142_051823	**Sampled by**	Donald Richmond
Sample Time	12:10	**Gallons Purged**	2.9	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	200	65.09	1.06	6.61	2.37	313	1.51	15	84.5	Orange	None
11:35	5	5	200	65.09	1.32	6.62	2.37	257	1.39	15	84.9	Orange	None
11:40	5	10	200	65.09	1.59	6.63	2.34	163	1.12	15.2	85.1	Orange	None
11:45	5	15	200	65.09	1.85	6.63	2.31	126	1.07	15.2	85.1	Orange	None
11:50	5	20	200	65.09	2.11	6.64	2.29	124	0.79	15.2	84.5	Orange	None
11:55	5	25	200	65.09	2.38	6.64	2.26	87.7	0.69	15.4	83.4	Orange	None
12:00	5	30	200	65.09	2.64	6.64	2.21	57.6	0.56	15.3	81.1	Orange	None
12:05	5	35	200	65.09	2.91	6.65	2.2	57	0.48	15.4	79.7	Orange	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-22-143	**Date(s):**	2023-05-19	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLOUDS, T:57.16 °F, rH:66%, Clouds: 100%, Wind:12.44mph S-SW			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	16.67	**Total Depth (ft-bmp):**	31	**Water Column(ft):**	14.33	**Gallons in Well:**	2.2928
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	8:35	**Total Volume Purged (milliliters):**	11000	**Sample ID:**	MW-22-143_051923	**Sample Time:**	09:30
Purge End Time:	09:25	**Well Volumes Purged (total):**	1.27	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
08:40	0	200	mL/min	16.92	6.87	3.089	40.8	0.68	12.4	48.3	Clear	No Odor
08:45	5	200	mL/min	16.96	6.9	3.097	32.5	0.52	12.5	-18.9	Clear	No Odor
08:50	10	200	mL/min	16.98	6.92	3.105	31.1	0.44	12.4	-29.6	Clear	No Odor
08:55	15	200	mL/min	17	6.94	3.137	19.8	0.37	12.5	-39.1	Clear	No Odor
09:00	20	200	mL/min	17.01	6.94	3.212	8.2	0.34	12.6	-52.3	Clear	No Odor
09:05	25	200	mL/min	17.02	6.94	3.28	7.19	0.3	12.6	-56.2	Clear	No Odor
09:10	30	200	mL/min	17.04	6.94	3.334	5.48	0.29	12.6	-59.5	Clear	No Odor
09:15	35	200	mL/min	17.04	6.95	3.382	4.3	0.29	12.6	-62	Clear	No Odor
09:20	40	200	mL/min	17.07	6.94	3.421	4.54	0.27	12.7	-63.1	Clear	No Odor
09:25	45	200	mL/min	17.07	6.95	3.435	3.12	0.24	12.7	-63.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

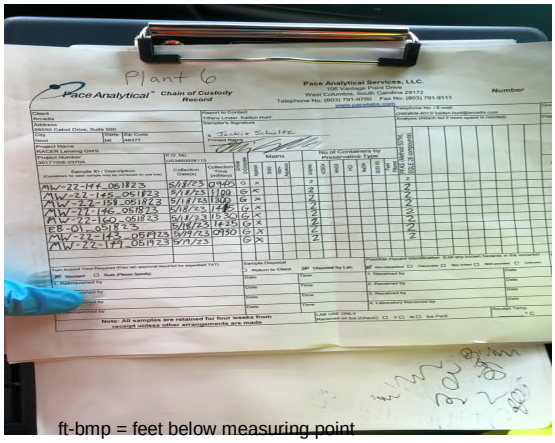
Comments: Retrieved old tubing when removing equipment from well.

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-144	**Date(s):**	2023-05-18	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLEAR, T:45.93 °F, rH:66%, Clouds: 0%, Wind:5.75mph SE			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	11.47	**Total Depth (ft-bmp):**	24.08	**Water Column(ft):**	12.61	**Gallons in Well:**	2.0176
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	9:15	**Total Volume Purged (milliliters):**	6000	**Sample ID:**	MW-22-144_051823	**Sample Time:**	09:45
Purge End Time:	09:40	**Well Volumes Purged (total):**	0.79	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:20	0	200	mL/min	12.21	6.98	1.195	2.37	1.18	10.9	69.3	Clear	No Odor
09:25	5	200	mL/min	12.27	6.99	1.204	1.8	1.1	11	71.7	Clear	No Odor
09:30	10	200	mL/min	12.34	7	1.21	1.57	1.07	11	76.5	Clear	No Odor
09:35	15	200	mL/min	12.38	7.01	1.216	1.49	1	11	78.7	Clear	No Odor
09:40	20	200	mL/min	12.41	7.01	1.216	0.05	0.99	11.1	84	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFASs (E537)	HDPE Plastic	2	None

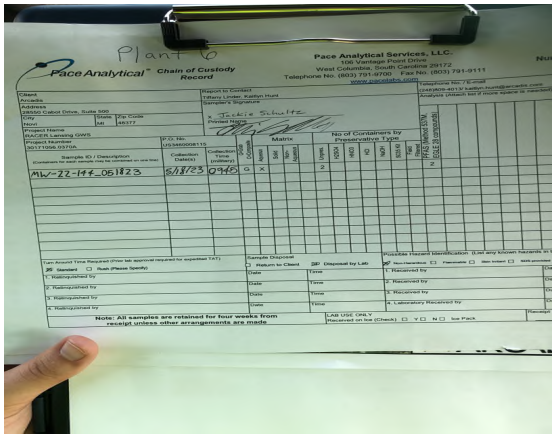
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-145	**Date(s):**	2023-05-18	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLOUDS, T:49.75 °F, rH:62%, Clouds: 12%, Wind:6.91mph SE			**Field Technician:**		NA	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	12.78	**Total Depth (ft-bmp):**	15.5	**Water Column(ft):**	2.72	**Gallons in Well:**	0.4352
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:05	**Total Volume Purged (milliliters):**	11000	**Sample ID:**	MW-22-145_051823	**Sample Time:**	11:00
Purge End Time:	10:55	**Well Volumes Purged (total):**	6.68	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:10	0	200	mL/min	12.78	7.08	1.045	28.8	2.67	10.9	147.9	Clear	No Odor
10:15	5	200	mL/min	12.78	7.06	1.039	22.6	2.61	10.9	148.9	Clear	No Odor
10:20	10	200	mL/min	12.78	7.09	1.036	17.7	2.67	10.9	107.5	Clear	No Odor
10:25	15	200	mL/min	12.78	7.04	1.035	14.8	2.47	10.9	142.8	Clear	No Odor
10:30	20	200	mL/min	12.78	7.04	1.044	11.5	2.4	10.9	150	Clear	No Odor
10:35	25	200	mL/min	12.78	7.03	1.047	8.8	2.43	10.9	153.3	Clear	No Odor
10:40	30	200	mL/min	12.78	7.03	1.057	6.52	2.32	10.9	155.9	Clear	No Odor
10:45	35	200	mL/min	12.78	7.02	1.067	2.39	2.29	11	158.3	Clear	No Odor
10:50	40	200	mL/min	12.78	7.02	1.07	4.13	2.22	11	159.7	Clear	No Odor
10:55	45	200	mL/min	12.78	7.02	1.074	3.2	2.2	11	161.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

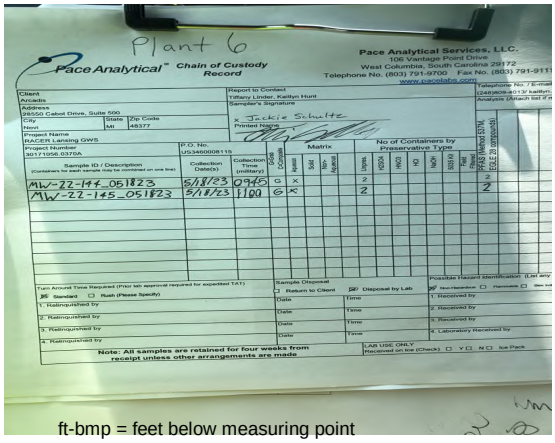
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-146	**Date(s):**	2023-05-18	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLEAR, T:63.79 °F, rH:30%, Clouds: 0%, Wind:8.05mph E-SE			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	4.81	**Total Depth (ft-bmp):**	10.5	**Water Column(ft):**	5.69	**Gallons in Well:**	0.9104
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	13:55	**Total Volume Purged (milliliters):**	3000	**Sample ID:**	MW-22-146_051823	**Sample Time:**	14:15
Purge End Time:	14:10	**Well Volumes Purged (total):**	0.87	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00	0	200	mL/min	5.51	7.52	0.793	3.28	6.31	10.4	197.4	Clear	No Odor
14:05	5	200	mL/min	5.79	7.48	0.793	3.99	6.43	10.5	195	Clear	No Odor
14:10	10	200	mL/min	5.99	7.44	0.792	4.25	6.74	10.4	197.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

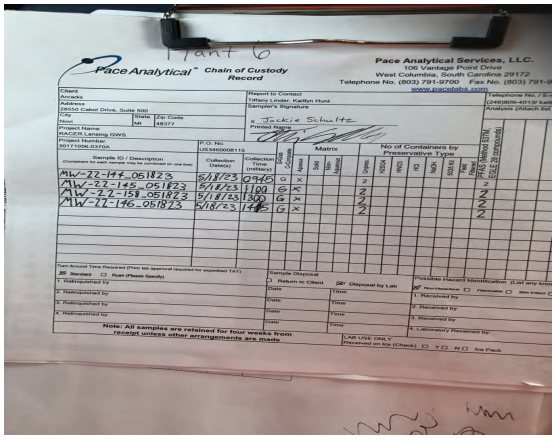
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-147	**Date(s):**	2023-05-19	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLOUDS, T:65.05 °F, rH:37%, Clouds: 35%, Wind:1.99mph W			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	9.02	**Total Depth (ft-bmp):**	12.5	**Water Column(ft):**	3.48	**Gallons in Well:**	0.5568
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	13:45	**Total Volume Purged (milliliters):**	6000	**Sample ID:**	MW-22-147_051923	**Sample Time:**	14:20
Purge End Time:	14:15	**Well Volumes Purged (total):**	2.85	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
13:50	0	200	mL/min	9.42	7.16	1.326	3.77	6.08	10.7	129.7	Clear	No Odor
13:55	5	200	mL/min	9.58	7.17	1.344	1.43	5.7	10.6	112.3	Clear	No Odor
14:00	10	200	mL/min	9.72	7.18	1.357	0.73	5.26	10.6	102.1	Clear	No Odor
14:05	15	200	mL/min	9.83	7.18	1.367	1.23	5.21	10.6	92.2	Clear	No Odor
14:10	20	200	mL/min	9.93	7.18	1.377	1.91	5.18	10.6	86.8	Clear	No Odor
14:15	25	200	mL/min	10.01	7.19	1.389	0.41	5.07	10.6	85.9	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

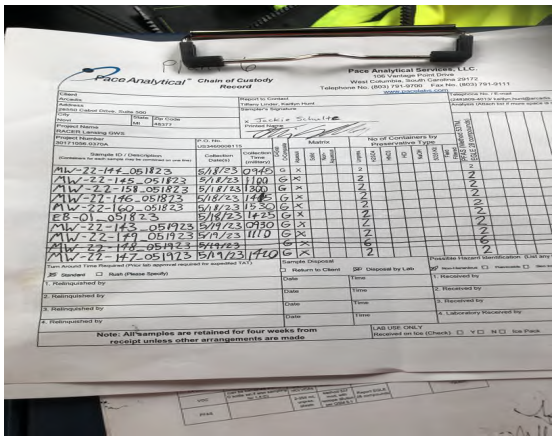
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-148			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	56 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.57	**Total Depth (ft-bmp)**	29.28	**Water Column (ft)**	4.71	**Gallons in Well**	0.77
Purge Start	08:20	**Pump Intake (ft-bmp)**	28.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	08:45	**Volumes Purged**	1.95	**Sample ID**	MW-22-148_052423	**Sampled by**	Anyssa Mandich
Sample Time	08:45	**Gallons Purged**	1.5	**Replicate/ Code No.**	MW-22-148_052423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:25	0	0	150	25.23	0.20	7.22	0.74	9.99	1.95	12.4	107.8	Clear	None
08:30	5	5	150	25.48	0.40	7.3	0.72	5.13	1.83	12.4	99.3	Clear	None
08:35	5	10	150	26.00	0.59	7.32	0.71	3.92	2.43	12.4	97.1	Clear	None
08:40	5	15	150	26.29	0.79	7.32	0.71	3.61	2.35	12.4	97.4	Clear	None
08:45	5	20	150	26.29	0.99	7.32	0.71	3.12	2.43	12.5	99.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	125 mL Plastic	6	None

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site P6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-22-149	**Date(s):**	2023-05-19	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLOUDS, T:65.05 °F, rH:37%, Clouds: 35%, Wind:1.99mph W			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	5.85	**Total Depth (ft-bmp):**	10.5	**Water Column(ft):**	4.65	**Gallons in Well:**	0.744
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:40	**Total Volume Purged (milliliters):**	5000	**Sample ID:**	MW-22-149_051923	**Sample Time:**	11:10
Purge End Time:	11:05	**Well Volumes Purged (total):**	1.78	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:45	0	200	mL/min	6.27	7.45	0.552	0.02	6.76	12	139.3	Clear	No Odor
10:50	5	200	mL/min	6.49	7.42	0.556	0.69	6.76	12	146.2	Clear	No Odor
10:55	10	200	mL/min	6.7	7.39	0.568	0.57	6.82	12	152.5	Clear	No Odor
11:00	15	200	mL/min	6.95	7.37	0.575	0.02	6.76	11.9	157.7	Clear	No Odor
11:05	20	200	mL/min	7.18	7.34	0.567	1.19	6.53	11.8	162.1	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

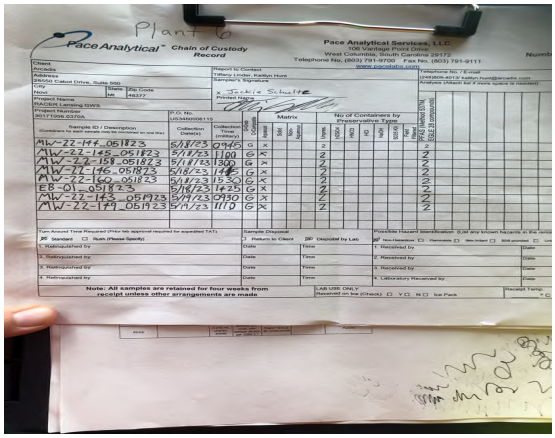
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-150			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	59 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.70	**Total Depth (ft-bmp)**	17.96	**Water Column (ft)**	12.26	**Gallons in Well**	1.99
Purge Start	09:25	**Pump Intake (ft-bmp)**	16.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:05	**Volumes Purged**	1.26	**Sample ID**	MW-22-150_052423	**Sampled by**	Anyssa Mandich
Sample Time	10:05	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	200	6.44	0.26	7.26	3.43	3.06	0.48	12	85.2	Clear	None
09:35	5	5	200	6.89	0.53	7.28	3.43	2.9	0.25	12	5	Clear	None
09:40	5	10	200	7.23	0.79	7.29	3.42	2.69	0.18	12	-20.9	Clear	None
09:45	5	15	200	7.87	1.06	7.3	3.4	3.45	0.18	11.7	-47.7	Clear	None
09:50	5	20	200	8.21	1.32	7.3	3.39	2.59	0.17	11.6	-56.9	Clear	None
09:55	5	25	200	8.54	1.59	7.31	3.39	2.32	0.17	11.6	-63.2	Clear	None
10:00	5	30	200	8.78	1.85	7.3	3.38	2.21	0.17	11.6	-69.7	Clear	None
10:05	5	35	200	9.02	2.11	7.31	3.38	2.1	0.17	11.5	-72.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-151			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	80 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.36	**Total Depth (ft-bmp)**	14.91	**Water Column (ft)**	8.55	**Gallons in Well**	1.39
Purge Start	17:15	**Pump Intake (ft-bmp)**	13.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	18:10	**Volumes Purged**	1.80	**Sample ID**	MW-22-151_052323	**Sampled by**	Anyssa Mandich
Sample Time	18:10	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
17:20	0	0	150	7.10	0.20	6.9	1.86	710	0.29	13.6	-23.3	Clear	None
17:25	5	5	150	7.21	0.40	6.91	1.85	573	0.22	13.5	-35	Clear	None
17:30	5	10	150	7.34	0.59	6.93	1.85	344	0.16	13.6	-56	Clear	None
17:35	5	15	150	7.36	0.79	6.93	1.85	271	0.14	13.6	-59.3	Clear	None
17:40	5	20	150	7.36	0.99	6.92	1.84	113	0.12	13.5	-66.7	Clear	None
17:45	5	25	150	7.36	1.19	6.92	1.84	37.3	0.12	13.5	-70.5	Clear	None
17:50	5	30	150	7.41	1.39	6.92	1.83	24.1	0.1	13.3	-74.7	Clear	None
17:55	5	35	150	7.41	1.59	6.92	1.84	16.1	0.1	13.3	-75.9	Clear	None
18:00	5	40	150	7.41	1.78	6.92	1.85	15.8	0.1	13.6	-77.8	Clear	None
18:05	5	45	150	7.41	1.98	6.92	1.84	14.3	0.1	13.5	-78.7	Clear	None
18:10	5	50	150	7.41	2.18	6.92	1.84	14.9	0.1	13.5	-79.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site Plant 6
Condition of Well: Good condition
Well Completion: Flush mount

Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-152			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	80 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.42	**Total Depth (ft-bmp)**	14.91	**Water Column (ft)**	7.49	**Gallons in Well**	1.22
Purge Start	16:05	**Pump Intake (ft-bmp)**	13.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:40	**Volumes Purged**	1.64	**Sample ID**	MW-22-152_052323	**Sampled by**	Anyssa Mandich
Sample Time	16:40	**Gallons Purged**	2	**Replicate/ Code No.**	DUP-08_052323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:10	0	0	150	7.42	0.20	6.98	0.9	19.4	0.26	12.6	6.2	Clear	None
16:15	5	5	150	7.83	0.40	7.01	0.85	3.89	0.19	12.6	-6.2	Clear	None
16:20	5	10	150	7.83	0.59	7.03	0.87	3.15	0.16	12.6	-19.7	Clear	None
16:25	5	15	150	7.86	0.79	7.02	0.85	2.12	0.14	12.7	-23.1	Clear	None
16:30	5	20	150	7.86	0.99	7.03	0.86	1.64	0.14	12.7	-27.7	Clear	None
16:35	5	25	150	7.86	1.19	7.02	0.85	1.09	0.14	12.8	-28.2	Clear	None
16:40	5	30	150	7.86	1.39	7.02	0.85	0.97	0.14	12.8	-30.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None
VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site P6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-22-153	**Date(s):**	2023-05-17	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:48.81 °F, rH:62%, Clouds: 0%, Wind:12.66mph NE			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	10.52	**Total Depth (ft-bmp):**	31.18	**Water Column(ft):**	20.66	**Gallons in Well:**	3.31
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	10:20	**Total Volume Purged (milliliters):**	8000	**Sample ID:**	MW-22-153_051723	**Sample Time:**	11:00
Purge End Time:	10:55	**Well Volumes Purged (total):**	0.64	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
10:25	0	200	mL/min	10.55	7.48	1.34	4.33	1.23	12.4	116	Clear	No Odor
10:30	5	200	mL/min	10.55	7.48	1.34	4.55	1.08	12.4	111.7	Clear	No Odor
10:35	10	200	mL/min	10.55	7.11	2.04	1.88	0.35	12.6	117	Clear	No Odor
10:40	15	200	mL/min	10.55	7.1	2.17	1.85	0.1	12.6	114.7	Clear	No Odor
10:45	20	200	mL/min	10.55	7.09	2.23	1.75	0.09	12.7	113.4	Clear	No Odor
10:51	26	200	mL/min	10.55	7.09	2.25	0.89	0.06	12.6	111	Clear	No Odor
10:55	30	200	mL/min	10.55	7.09	2.25	0.02	0.06	12.7	109.7	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
VOCs (SW8260), 1,4-D	Clear Glass	3	HCl

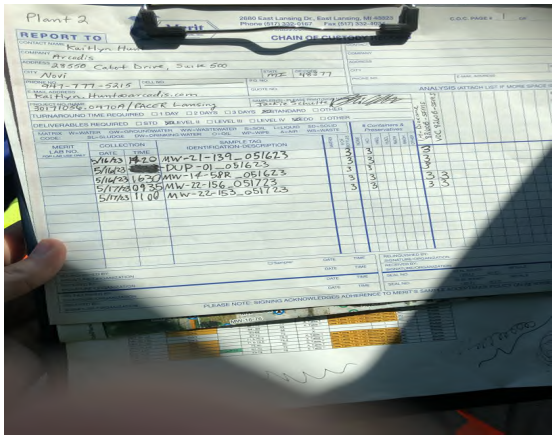
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-154			**Date**	5/1/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	40 °F, Overcast, W winds at 10 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.72	**Total Depth (ft-bmp)**	10.56	**Water Column (ft)**	5.84	**Gallons in Well**	0.95
Purge Start	11:55	**Pump Intake (ft-bmp)**	8.56	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:25	**Volumes Purged**	1.67	**Sample ID**	MW-22-154_050123	**Sampled by**	Austin Westhuis
Sample Time	12:20	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	200	5.07	0.26	7.15	2.49	7.44	0.23	9.2	58.2	Clear	None
12:05	5	5	200	5.07	0.53	7.18	2.46	4.33	0.22	9.3	45	Clear	None
12:10	5	10	200	5.07	0.79	7.19	2.46	3.87	0.2	9.2	38.7	Clear	None
12:15	5	15	200	5.07	1.06	7.2	2.46	3.43	0.2	9.2	34.4	Clear	None
12:20	5	20	200	5.07	1.32	7.21	2.47	3.01	0.2	9.3	32	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

Location ID:	MW-22-155	**Date(s):**	2023-05-17	**Work Order(s):**			Q2 2023 GWS (Q, SA event)
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:68.54 °F, rH:31%, Clouds: 0%, Wind:4.61mph N			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	11.82	**Total Depth (ft-bmp):**	31.5	**Water Column(ft):**	19.68	**Gallons in Well:**	3.1488
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	12:00	**Total Volume Purged (milliliters):**	11000	**Sample ID:**	MW-22-155_051723	**Sample Time:**	13:06
Purge End Time:	13:05	**Well Volumes Purged (total):**	0.92	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
12:05	0	200	mL/min	11.9	6.21	0	31.6	9.18	19.2	-255.1	Clear	No Odor
12:10	5	200	mL/min	11.9	6.01	0	37.9	9.33	18.6	-240.1	Clear	No Odor
12:15	10	200	mL/min	11.9	5.96	0	51.2	9.2	18.5	-239.5	Clear	No Odor
12:20	15	200	mL/min	11.9	5.8	0	63	8.79	18.9	-245.4	Clear	No Odor
12:25	20	200	mL/min	11.9	5.66	0	60.2	8.58	19.2	-264.5	Clear	No Odor
12:33	28	200	mL/min	11.9	7.14	0	47.5	10.08	16.4	48.6	Clear	No Odor
12:38	33	200	mL/min	11.9	6.87	0	50.6	8.93	18.3	28.1	Clear	No Odor
12:43	38	200	mL/min	11.9	6.75	0	42.6	8.49	19.2	15.1	Clear	No Odor
12:48	43	200	mL/min	11.9	6.58	0	40.3	8.25	19.7	-5	Clear	No Odor
12:53	48	200	mL/min	11.9	6.62	0	43.5	8.1	20	-55.9	Clear	No Odor
13:01	56	200	mL/min	11.9	7.91	0	39.8	7.9	20.1	-64	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
VOCs, 1,4-D	Clear Glass	3	HCl

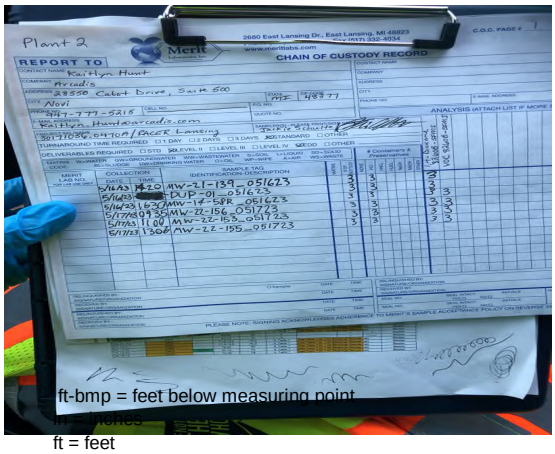
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-156	**Date(s):**	2023-05-17	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:45.03 °F, rH:72%, Clouds: 0%, Wind:6.91mph NE			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	12.99	**Total Depth (ft-bmp):**	31.6	**Water Column(ft):**	18.61	**Gallons in Well:**	2.9776
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	9:05	**Total Volume Purged (milliliters):**	5000	**Sample ID:**	MW-22-156_051723	**Sample Time:**	09:35
Purge End Time:	09:35	**Well Volumes Purged (total):**	0.44	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm^c)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
09:10	0	200	mL/min	12.99	7.63	1.66	0.02	4.49	12.3	140.7	Clear	No Odor
09:15	5	200	mL/min	12.99	7.26	1.87	0.02	0.72	12.5	135	Clear	No Odor
09:20	10	200	mL/min	12.99	7.21	2.03	0.02	0.47	12.7	130.6	Clear	No Odor
09:25	15	200	mL/min	12.99	7.19	2.08	1.09	0.23	12.7	127.2	Clear	No Odor
09:30	20	200	mL/min	12.99	7.19	2.08	1.13	0.24	12.7	123.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
VOCs (SW8260), 1,4-D	Clear Glass	3	HCl

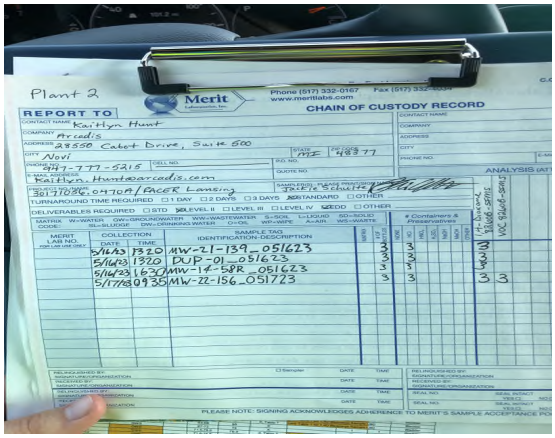
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-157	**Date(s):**	2023-05-17	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	2
Weather(°F):	CLEAR, T:56.5 °F, rH:50%, Clouds: 0%, Wind:11.5mph N-NE			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	2.5	**Total Depth (ft-bmp):**	27.63	**Water Column(ft):**	25.13	**Gallons in Well:**	4.02
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	14:20	**Total Volume Purged (milliliters):**	10000	**Sample ID:**	MW-22-157_051723	**Sample Time:**	15:10
Purge End Time:	15:06	**Well Volumes Purged (total):**	0.66	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
14:25	0	200	mL/min	2.58	7.18	1.284	0.02	4.3	14	216	Clear	No Odor
14:30	5	200	mL/min	2.58	7.21	1.285	0.3	4.24	13.9	198.8	Clear	No Odor
14:35	10	200	mL/min	2.58	6.97	1.441	1.56	1.4	14.1	-2	Clear	No Odor
14:40	15	200	mL/min	2.58	6.98	1.455	1.48	0.56	14	-16.1	Clear	No Odor
14:45	20	200	mL/min	5.58	6.99	1.452	2.27	0.58	14.1	-22.9	Clear	No Odor
14:50	25	200	mL/min	2.58	6.99	1.477	0.02	0.37	14.1	-42.1	Clear	No Odor
14:55	30	200	mL/min	2.58	7	1.482	0.75	0.29	14.1	-51	Clear	No Odor
15:00	35	200	mL/min	2.58	7	1.482	0.18	0.27	14.1	-55.5	Clear	No Odor
15:05	40	200	mL/min	2.58	7	1.482	0.58	0.23	14.1	-59.6	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
1,4-D	Clear Glass	3	HCl

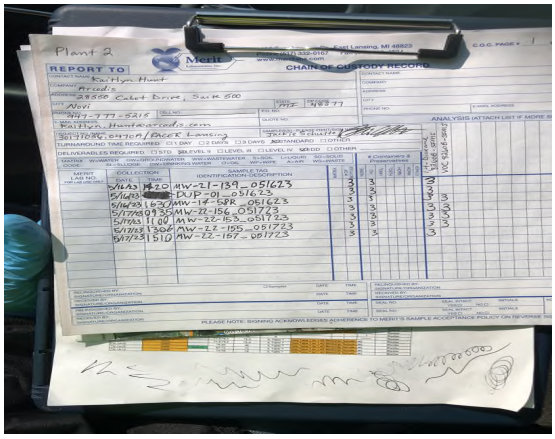
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-158	**Date(s):**	2023-05-18	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLEAR, T:65.46 °F, rH:36%, Clouds: 0%, Wind:0mph N			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	12.84	**Total Depth (ft-bmp):**	21	**Water Column(ft):**	8.16	**Gallons in Well:**	1.31
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	12:30	**Total Volume Purged (milliliters):**	5000	**Sample ID:**	MW-22-158_051823	**Sample Time:**	13:00
Purge End Time:	12:55	**Well Volumes Purged (total):**	1.01	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35	0	200	mL/min	13.15	7.07	3.416	5.52	0.53	11.2	-3.7	Clear	No Odor
12:40	5	200	mL/min	13.19	7.03	3.421	3.47	0.37	11.2	-7	Clear	No Odor
12:45	10	200	mL/min	13.24	7.02	3.434	2.74	0.3	11.3	-14	Clear	No Odor
12:50	15	200	mL/min	13.24	7.02	3.479	2.15	0.26	11.2	-18.8	Clear	No Odor
12:55	20	200	mL/min	13.24	7.02	3.535	2.99	0.24	11.2	-21.2	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

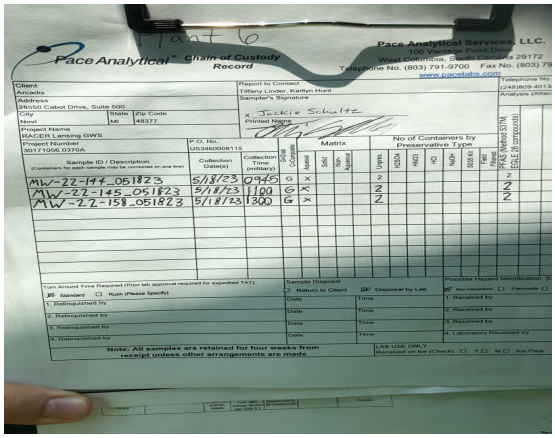
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

Location ID:	MW-22-160	**Date(s):**	2023-05-18	**Work Order(s):**		Q2 2023 GWS (Q, SA event)	
Client:	RACER	**Facility:**	Lansing	**Facility Location:**	2801 W. Saginaw St., Lansing, MI	**Area:**	6
Weather(°F):	CLEAR, T:65.46 °F, rH:36%, Clouds: 0%, Wind:0mph N			**Field Technician:**		Jackie Schulte	
Measuring Pt. Description:	Top of Inner Casing	**Screen Setting (ft-bgs):**	-	**Casing Diameter (in):**	2.00	**Well Casing Material:**	PVC
Static Water Level (ft-bmp):	13.68	**Total Depth (ft-bmp):**	19	**Water Column(ft):**	5.32	**Gallons in Well:**	0.8512
Depth to Product (ft-bmp):	NA	**Pump Intake Depth(ft-bmp):**	NA	**Purge Method:**	Low Flow	**Purging Equipment:**	Peristaltic Pump
Purge Start Time:	15:05	**Total Volume Purged (milliliters):**	5000	**Sample ID:**	MW-22-160_051823	**Sample Time:**	15:30
Purge End Time:	15:25	**Well Volumes Purged (total):**	1.55	**Replicate Type / Replicate ID:**	NA / NA	**Water Quality Meter/ ID:**	Hach 2100Q,YSI Pro Plus / NA
Scope of work completed?	Yes						

Time	Total Elapsed (min)	Flow Rate	Flow Rate Unit	Depth to Water (ft)	pH (S.U.)	Specific Conductivity (mS/cm[c])	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	Redox (mV)	Appearance	
											Color	Odor
15:10	0	200	mL/min	13.68	6.92	1.316	4.38	0.58	11.4	-41.8	Clear	No Odor
15:15	5	200	mL/min	13.68	6.91	1.313	3.39	0.37	11.3	-42.7	Clear	No Odor
15:20	10	200	mL/min	13.68	6.9	1.312	2.41	0.29	11.2	-43	Clear	No Odor
15:25	15	200	mL/min	13.68	6.89	1.313	2.11	0.26	11.2	-42.7	Clear	No Odor

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL HDPE	2	None

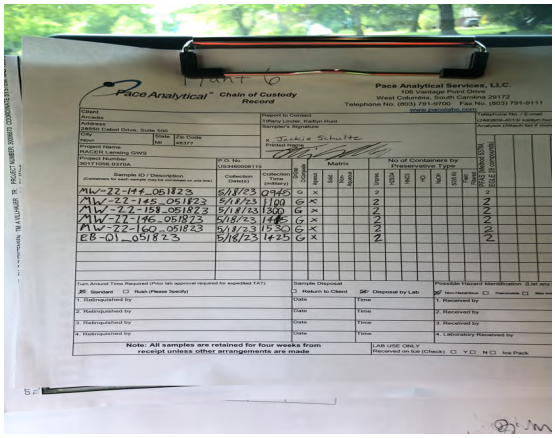
Comments: None

Well Information:

Well Labeled Properly: yes

Is Well in Good Condition? good

Well Inspection Comments: NA



Description: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
uS/cm = microSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
S.U = standard units
mS/cm = milli

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-01			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.96	**Total Depth (ft-bmp)**	86	**Water Column (ft)**	21.04	**Gallons in Well**	30.77
Purge Start	13:05	**Pump Intake (ft-bmp)**	83.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:35	**Volumes Purged**	0.04	**Sample ID**	PW-14-01_051823	**Sampled by**	Donald Richmond
Sample Time	13:35	**Gallons Purged**	1.32	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	64.96	0.53	7.38	3.28	12	8.98	18.7	73	Clear	None
13:20	5	5	200	64.96	0.79	7.42	3.28	5.34	8.39	19	70.3	Clear	None
13:25	5	10	200	64.96	1.06	7.43	3.3	5.69	8.06	18.9	68.5	Clear	None
13:30	5	15	200	64.96	1.32	7.43	3.29	4.8	8.28	19	68.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-02			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	59.0 degrees F and Clear. The wind is blowing S/SE at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.00	**Total Depth (ft-bmp)**	88	**Water Column (ft)**	23.00	**Gallons in Well**	3.74
Purge Start	13:15	**Pump Intake (ft-bmp)**	85.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:50	**Volumes Purged**	0.49	**Sample ID**	PW-14-02_051823	**Sampled by**	Austin Westhuis
Sample Time	13:45	**Gallons Purged**	1.85	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	200	65.00	0.26	7.12	1.83	22.6	9.3	14.9	-25.9	Clear	None
13:25	5	5	200	65.00	0.53	7.27	1.82	11.4	8.01	14.8	-40.9	Clear	None
13:30	5	10	200	65.00	0.79	7.32	1.82	4.41	8	14.8	-41.7	Clear	None
13:35	5	15	200	65.00	1.06	7.36	1.82	2.08	7.62	14.8	-19.9	Clear	None
13:40	5	20	200	65.00	1.32	7.37	1.82	1.79	7.52	14.8	-19	Clear	None
13:45	5	25	200	65.00	1.59	7.37	1.82	1.7	7.5	14.7	-15	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-03			**Date**	5/20/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	51.1 degrees F and Cloudy. The wind is blowing W/NW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	70.07	**Total Depth (ft-bmp)**	95.5	**Water Column (ft)**	25.43	**Gallons in Well**	37.19
Purge Start	11:40	**Pump Intake (ft-bmp)**	93	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:15	**Volumes Purged**	0.02	**Sample ID**	PW-14-03_052023	**Sampled by**	Billy Cobern
Sample Time	12:15	**Gallons Purged**	0.92	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	100	70.25	0.13	7.05	3.57	42.6	9.96	13.5	68.4	Clear	None
11:50	5	5	100	70.35	0.26	6.81	3.66	32.1	9.44	14	69.6	Clear	None
11:55	5	10	100	70.39	0.40	6.78	3.67	28.7	8.76	13.9	71.7	Clear	None
12:00	5	15	100	70.39	0.53	6.8	3.72	33.7	8.93	12.5	84.8	Clear	None
12:05	5	20	100	70.39	0.66	6.8	3.7	33.1	7.61	12.2	95.6	Clear	None
12:10	5	25	100	70.39	0.79	6.8	3.7	36.3	7.53	12.3	99.4	Clear	None
12:15	5	30	100	70.39	0.92	6.8	3.69	35.2	7.69	12.3	100.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-02			**Date**	5/18/2023
Project Name/Location	RACER Lansing GWS 2023	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.07	**Total Depth (ft-bmp)**	71.6	**Water Column (ft)**	13.53	**Gallons in Well**	2.20
Purge Start	14:05	**Pump Intake (ft-bmp)**	69.1	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:30	**Volumes Purged**	0.48	**Sample ID**	TW-14-02_051823	**Sampled by**	Donald Richmond
Sample Time	14:30	**Gallons Purged**	1.06	**Replicate/ Code No.**	DUP-03_051823	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:15	0	0	200	58.07	0.53	7.74	4.49	52.2	8.36	21.3	81.3	Clear	None
14:20	5	5	200	58.07	0.79	7.71	4.51	50.5	8.42	21.5	80.7	Clear	None
14:25	5	10	200	58.07	1.06	7.69	4.51	52.1	8.16	21.6	80.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-06			**Date**	5/23/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	65 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	83.10	**Total Depth (ft-bmp)**	85.55	**Water Column (ft)**	2.45	**Gallons in Well**	0.40
Purge Start	10:00	**Pump Intake (ft-bmp)**	84.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:00	**Volumes Purged**	2.50	**Sample ID**	TW-14-06_052323	**Sampled by**	Anyssa Mandich
Sample Time	11:00	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	125	78.40	0.17	7.72	0.022		8	18.1	264.7	Brown	None
10:10	5	5	125	73.50	0.33	7.6	2.47	888	9.34	16.6	256.9	Brown	None
10:15	5	10	125	72.84	0.50	7.54	2.89		9.53	16.5	258.3	Brown	None
10:20	5	15	125	73.87	0.66	7.58	2.85		10.86	16.2	258.3	Brown	None
10:25	5	20	125	73.87	0.83	7.61	2.81		9.96	16.2	257.9	Brown	None
10:30	5	25	125	72.12	0.99	7.49	2.75		14.41	16.2	272.7	Brown	None
10:35	5	30	125	70.57	1.16	7.5	2.82		12.97	16.3	272.7	Brown	None
10:40	5	35	125	71.20	1.32	7.59	2.72		11.07	16.3	270.4	Brown	None
10:45	5	40	125	68.70	1.49	7.6	2.81		10.3	16.3	268.3	Brown	None
10:50	5	45	125	70.23	1.65	7.5	2.95		13.32	16.3	268.6	Brown	None
10:55	5	50	125	69.87	1.82	7.49	2.89		13.08	16.3	268.5	Brown	None
11:00	5	55	125	68.69	1.98	7.5	2.92		11.94	16.4	267.9	Brown	None

Constituent Sampled	Container	Number	Preservative
Total P, TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
Nitrogen, Nitrate-Nitrite	125 mL Plastic	1	None

Comments: Well under pressure. Replaced j-plug with bleeder valve j-plug. Water level oscillating due to system running

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival:
Well Locked at Departure:
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-11			**Date**	5/20/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	52.0 degrees F and Cloudy. The wind is blowing W at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.14	**Total Depth (ft-bmp)**	86.9	**Water Column (ft)**	22.76	**Gallons in Well**	3.70
Purge Start	12:45	**Pump Intake (ft-bmp)**	84	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:10	**Volumes Purged**	0.18	**Sample ID**	TW-15-11_052023	**Sampled by**	Billy Cobern
Sample Time	13:10	**Gallons Purged**	0.66	**Replicate/ Code No.**	DUP-06_052023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	100	64.45	0.13	7.27	3.52	54.5	8.69	15.1	114.7	Brown	None
12:55	5	5	100	64.45	0.26	7.25	3.52	50.6	8.42	15.2	115.5	Brown	None
13:00	5	10	100	64.45	0.40	7.22	3.53	52.7	8.12	15.4	121.1	Brown	None
13:05	5	15	100	64.45	0.53	7.22	3.53	56.7	8.36	15.3	121.7	Brown	None
13:10	5	20	100	64.45	0.66	7.22	3.54	53.1	8.66	15.5	123.1	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-12			**Date**	5/17/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	57.0 degrees F and Clear. The wind is blowing E/NE at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.59	**Total Depth (ft-bmp)**	76.8	**Water Column (ft)**	15.21	**Gallons in Well**	9.89
Purge Start	15:10	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:50	**Volumes Purged**	0.11	**Sample ID**	TW-15-12_051723	**Sampled by**	Billy Cobern
Sample Time	15:50	**Gallons Purged**	1.06	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:15	0	0	100	61.91	0.13	7.86	2.34	54.9	8.29	17	142.3	Clear	None
15:20	5	5	100	61.91	0.26	7.73	2.47	31.5	7.99	17.1	154.8	Clear	None
15:25	5	10	100	61.91	0.40	7.69	2.47	28.7	8.11	17.4	166.8	Clear	None
15:30	5	15	100	61.91	0.53	7.67	2.47	27.5	8.18	17.8	173.2	Clear	None
15:35	5	20	100	61.91	0.66	7.65	2.47	25.1	7.73	17.4	183.3	Clear	None
15:40	5	25	100	61.91	0.79	7.64	2.47	23.1	7.38	17.4	187.5	Clear	None
15:45	5	30	100	61.91	0.92	7.64	2.47	22.6	7.41	17.5	191.3	Clear	None
15:50	5	35	100	61.91	1.06	7.64	2.47	21.8	7.35	17.5	191.9	Clear	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
TKN/Total Phosphorus	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	UNK-15			**Date**	5/24/2023
Project Name/Location	RACER Lansing GWS 2023		**Weather(°F)**	61.0 degrees F and Clear. The wind is blowing NE at 16.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.75	**Total Depth (ft-bmp)**	16	**Water Column (ft)**	15.25	**Gallons in Well**	9.91
Purge Start	15:00	**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:00	**Volumes Purged**	0.25	**Sample ID**	UNK-15_052423	**Sampled by**	Kaitlyn Hunt
Sample Time	15:55	**Gallons Purged**	2.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:05	0	0	200	1.15	0.26	7.91	0.52	2.02	1.01	13.9	91.5	Clear	None
15:10	5	5	200	1.51	0.53	7.91	0.52	2.38	0.97	13.9	89.3	Clear	None
15:15	5	10	200	1.95	0.79	7.91	0.52	1.83	0.85	14.1	82	Clear	None
15:20	5	15	200	2.22	1.06	7.9	0.52	2.07	0.71	13.9	78.8	Clear	None
15:25	5	20	200	2.50	1.32	7.91	0.52	1.69	0.66	13.9	74.9	Clear	None
15:30	5	25	150	2.72	1.52	7.92	0.53	1.87	0.51	14.3	70.2	Clear	None
15:35	5	30	150	2.72	1.72	7.89	0.52	2.16	0.25	14.2	68.9	Clear	None
15:40	5	35	150	3.09	1.92	7.91	0.52	1.53	0.39	14.4	66.1	Clear	None
15:45	5	40	150	3.09	2.11	7.89	0.51	1.92	0.35	14.2	64.1	Clear	None
15:50	5	45	150	3.09	2.31	7.9	0.51	1.3	0.38	14.2	61.9	Clear	None
15:55	5	50	150	3.09	2.51	7.89	0.51	1.3	0.36	14.3	59.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A06			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Partly Cloudy. The wind is blowing N at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.65	**Total Depth (ft-bmp)**	92.6	**Water Column (ft)**	25.95	**Gallons in Well**	4.22
Purge Start	11:10	**Pump Intake (ft-bmp)**	90	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:40	**Volumes Purged**	0.19	**Sample ID**	AS-19-A06_083023	**Sampled by**	Billy Cobern
Sample Time	11:40	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:10	0	0	100	66.65	0.00	0	0	0	0	0	0	Clear	None
11:15	5	5	100	67.08	0.13	7.52	1.21	28.6	2.93	17.1	89.2	Clear	None
11:20	5	10	100	67.38	0.26	7.51	1.22	14.7	1.41	17	88.8	Clear	None
11:25	5	15	100	67.72	0.40	7.52	1.23	13.2	1.33	17.4	88.4	Clear	None
11:30	5	20	100	68.08	0.53	7.51	1.23	10.6	1.12	17.4	90.1	Clear	None
11:35	5	25	100	68.44	0.66	7.52	1.23	9.92	1.15	17.4	91.8	Clear	None
11:40	5	30	100	68.83	0.79	7.52	1.23	9.72	1.16	17.5	92.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	AS-19-A07			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	60.1 degrees F and Mostly Cloudy. The wind is blowing N at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.06	**Total Depth (ft-bmp)**	91.2	**Water Column (ft)**	22.14	**Gallons in Well**	3.60
Purge Start	09:35	**Pump Intake (ft-bmp)**	88.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:35	**Volumes Purged**	0.44	**Sample ID**	AS-19-A07_083023	**Sampled by**	Billy Cobern
Sample Time	10:35	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	100	69.06	0.00	0	0	0	0	0	0	Clear	None
09:40	5	5	100	69.85	0.13	7.06	1.83	124	3.85	17.5	73.6	Clear	None
09:45	5	10	100	70.39	0.26	7.05	1.84	153	3.15	17.4	73.4	Clear	None
09:50	5	15	100	70.92	0.40	7.04	1.84	131	2.83	17.5	73.3	Clear	None
09:55	5	20	100	71.48	0.53	7.04	1.85	98.4	2.63	17.6	73.2	Clear	None
10:00	5	25	100	72.02	0.66	7.03	1.85	87.2	2.44	17.6	73.2	Clear	None
10:05	5	30	100	72.02	0.79	7.03	1.86	68.4	2.32	17.6	73.3	Clear	None
10:10	5	35	100	72.53	0.92	7.03	1.86	54.4	2.21	17.7	73.5	Clear	None
10:15	5	40	100	72.99	1.06	7.03	1.86	48.3	2.12	17.7	73.6	Clear	None
10:20	5	45	100	73.45	1.19	7.03	1.86	41.3	2.01	17.9	74.2	Clear	None
10:25	5	50	100	73.89	1.32	7.03	1.86	39.8	2.02	17.8	74.4	Clear	None
10:30	5	55	100	74.21	1.45	7.03	1.86	37.2	2.04	17.8	74.6	Clear	None
10:35	5	60	100	74.60	1.59	7.03	1.86	37.7	1.98	17.8	74.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-21			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Mostly Clear. The wind is blowing N at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.75	**Total Depth (ft-bmp)**	78.04	**Water Column (ft)**	13.29	**Gallons in Well**	2.16
Purge Start	12:25	**Pump Intake (ft-bmp)**	75.54	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:55	**Volumes Purged**	0.73	**Sample ID**	MW-12-21_083023	**Sampled by**	Austin Westhuis
Sample Time	12:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	200	65.09	0.26	6.92	1.53	45.6	8.76	15	-27.4	Clear	None
12:35	5	5	200	65.21	0.53	6.76	1.52	13.1	7.82	15.5	-23.5	Clear	None
12:40	5	10	200	65.31	0.79	6.75	1.5	4.66	7.4	15.2	-21.1	Clear	None
12:45	5	15	200	65.36	1.06	6.76	1.48	4.25	7.34	15.1	-16.5	Clear	None
12:50	5	20	200	65.39	1.32	6.76	1.47	4.02	7.22	14.9	-13.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-22			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Clear. The wind is blowing N/NW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.40	**Total Depth (ft-bmp)**	96.12	**Water Column (ft)**	26.72	**Gallons in Well**	4.34
Purge Start	13:10	**Pump Intake (ft-bmp)**	93.62	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:00	**Volumes Purged**	0.61	**Sample ID**	MW-13-22_083023	**Sampled by**	Austin Westhuis
Sample Time	13:55	**Gallons Purged**	2.641721	**Replicate/ Code No.**	MW-13-22_083023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	69.42	0.26	6.85	1.82		5.58	17.5	-14.8	Clear	None
13:20	5	5	200	69.42	0.53	6.79	1.79	646	4.16	14.9	-25.5	Clear	None
13:25	5	10	200	69.42	0.79	6.74	1.76	212	3.37	14.3	-30.8	Clear	None
13:30	5	15	200	69.42	1.06	6.73	1.75	77.5	3.28	14.3	-32.4	Clear	None
13:35	5	20	200	69.42	1.32	6.72	1.75	51.1	3.09	14.3	-34.6	Clear	None
13:40	5	25	200	69.42	1.59	6.72	1.75	46.8	3.08	14.3	-34.8	Clear	None
13:45	5	30	200	69.42	1.85	6.72	1.75	40.3	2.84	14.5	-36.4	Clear	None
13:50	5	35	200	69.42	2.11	6.73	1.74	38.9	2.65	14.3	-38.7	Clear	None
13:55	5	40	200	69.42	2.38	6.73	1.74	36.9	2.61	14.4	-39.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments: MS/MSD collected here.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-34			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	60.1 degrees F and Mostly Cloudy. The wind is blowing N at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.55	**Total Depth (ft-bmp)**	79.84	**Water Column (ft)**	13.29	**Gallons in Well**	2.16
Purge Start	10:10	**Pump Intake (ft-bmp)**	77.34	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:45	**Volumes Purged**	0.86	**Sample ID**	MW-13-34_083023	**Sampled by**	Austin Westhuis
Sample Time	10:40	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:15	0	0	200	66.55	0.26	6.94	1.88	421	0.32	14.3	-46.1	Clear	None
10:20	5	5	200	66.55	0.53	6.93	1.9	377	0.29	14.2	-47.1	Clear	None
10:25	5	10	200	66.55	0.79	6.92	1.94	353	0.29	14.3	-49.1	Clear	None
10:30	5	15	200	66.55	1.06	6.92	1.95	322	0.27	14.4	-52.1	Clear	None
10:35	5	20	200	66.55	1.32	6.93	1.96	307	0.26	14.4	-56.3	Clear	None
10:40	5	25	200	66.55	1.59	6.93	1.96	301	0.26	14.3	-59.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-58R			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.84	**Total Depth (ft-bmp)**	29.6	**Water Column (ft)**	16.76	**Gallons in Well**	2.72
Purge Start	15:00	**Pump Intake (ft-bmp)**	27.1	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:50	**Volumes Purged**	0.78	**Sample ID**	MW-14-58R_082923	**Sampled by**	Donald Richmond
Sample Time	15:45	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:10	0	0	200	12.84	0.53	6.98	2.8	107	0.25	18.7	-49.9	Clear	None
15:15	5	5	200	12.84	0.79	6.9	2.78	32	0.17	18	-51.6	Clear	None
15:20	5	10	200	12.84	1.06	6.9	2.78	22.2	0.14	18.1	-53.4	Clear	None
15:25	5	15	200	12.84	1.32	6.91	2.73	19.5	0.14	17.2	-54.1	Clear	None
15:30	5	20	200	12.84	1.59	6.9	2.74	9.46	0.15	17.7	-54.7	Clear	None
15:35	5	25	200	12.84	1.85	6.91	2.76	8.39	0.14	18	-55.7	Clear	None
15:40	5	30	200	12.84	2.11	6.92	2.76	8.71	0.14	17.9	-57	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-78			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	63.0 degrees F and Clear. The wind is blowing S/SW at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.77	**Total Depth (ft-bmp)**	76.7	**Water Column (ft)**	11.93	**Gallons in Well**	1.94
Purge Start	09:15	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:05	**Volumes Purged**	0.68	**Sample ID**	MW-16-78_082923	**Sampled by**	Billy Cobern
Sample Time	10:05	**Gallons Purged**	1.32086	**Replicate/ Code No.**	MW-16-78_082923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	100	64.77	0.00	0	0	0	0	0	0	Clear	None
09:20	5	5	100	64.80	0.13	7.03	1.44	31.3	2.03	17	108.2	Clear	None
09:25	5	10	100	64.80	0.26	7.02	1.43	27.4	1.24	16.8	106.7	Clear	None
09:30	5	15	100	64.80	0.40	7.01	1.41	22.7	0.61	16.4	104.1	Clear	None
09:35	5	20	100	64.80	0.53	7.02	1.41	18.4	0.49	16.3	101	Clear	None
09:40	5	25	100	64.80	0.66	7.02	1.41	14.8	0.45	16.3	99.4	Clear	None
09:45	5	30	100	64.80	0.79	7.02	1.41	11.1	0.47	16.4	97.7	Clear	None
09:50	5	35	100	64.80	0.92	7.02	1.41	10.3	0.46	16.4	96.4	Clear	None
09:55	5	40	100	64.80	1.06	7.03	1.41	9.58	0.44	16.4	95.5	Clear	None
10:00	5	45	100	64.80	1.19	7.03	1.41	9.23	0.42	16.4	95.1	Clear	None
10:05	5	50	100	64.80	1.32	7.03	1.41	9.06	0.42	16.3	95	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-121			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	66.9 degrees F and Clear. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.97	**Total Depth (ft-bmp)**	71.15	**Water Column (ft)**	7.18	**Gallons in Well**	1.17
Purge Start	10:35	**Pump Intake (ft-bmp)**	68.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:25	**Volumes Purged**	1.13	**Sample ID**	MW-19-121_082923	**Sampled by**	Billy Cobern
Sample Time	11:25	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	100	63.97	0.00	0	0	0	0	0	0	Clear	None
10:40	5	5	100	64.30	0.13	7.88	1.58	22.7	1.32	20.6	86.6	Clear	None
10:45	5	10	100	64.30	0.26	7.71	2.27	20.5	8.25	19.1	86.7	Clear	None
10:50	5	15	100	64.30	0.40	7.7	2.26	39.5	7.98	184	86.8	Clear	None
10:55	5	20	100	64.30	0.53	7.69	2.25	62.1	8.52	18.2	86.7	Clear	None
11:00	5	25	100	64.30	0.66	7.71	2.23	31.9	8.03	17.5	86.2	Clear	None
11:05	5	30	100	64.30	0.79	7.7	2.25	42.9	7.71	17.7	85.9	Clear	None
11:10	5	35	100	64.30	0.92	7.7	2.24	28.9	8.18	18	86.1	Clear	None
11:15	5	40	100	64.30	1.06	7.68	2.24	26.7	7.49	17.7	86.5	Clear	None
11:20	5	45	100	64.30	1.19	7.67	2.24	25.1	7.28	17.8	86.7	Clear	None
11:25	5	50	100	64.30	1.32	7.67	2.23	24.3	7.76	17.8	86.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-122			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Mostly Cloudy. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.80	**Total Depth (ft-bmp)**	66.85	**Water Column (ft)**	3.05	**Gallons in Well**	0.50
Purge Start	11:50	**Pump Intake (ft-bmp)**	66	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:25	**Volumes Purged**	1.85	**Sample ID**	MW-19-122_082923	**Sampled by**	Billy Cobern
Sample Time	12:25	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	100	63.80	0.00	0	0	0	0	0	0	Clear	None
11:55	5	5	100	64.10	0.13	6.62	5.14	872	1	18.4	126.2	Clear	None
12:00	5	10	100	64.10	0.26	6.62	5.09	739	0.94	17.6	124.3	Clear	None
12:05	5	15	100	64.10	0.40	6.61	5	364	0.83	17.5	122.4	Clear	None
12:10	5	20	100	64.10	0.53	6.61	4.93	192	1.02	17.5	121.3	Clear	None
12:15	5	25	100	64.10	0.66	6.6	4.85	25.8	1.05	17.3	120.6	Clear	None
12:20	5	30	100	64.10	0.79	6.6	4.85	23.9	0.96	17.3	120.3	Clear	None
12:25	5	35	100	64.10	0.92	6.6	4.84	24.2	1.02	17.3	120.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-123			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.0 degrees F and Partly Cloudy. The wind is blowing W/SW at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.73	**Total Depth (ft-bmp)**	73.8	**Water Column (ft)**	10.07	**Gallons in Well**	1.64
Purge Start	15:20	**Pump Intake (ft-bmp)**	71	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:00	**Volumes Purged**	0.64	**Sample ID**	MW-19-123_082923	**Sampled by**	Billy Cobern
Sample Time	16:00	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:20	0	0	100	63.73	0.00	0	0	0	0	0	0	Clear	None
15:25	5	5	100	64.12	0.13	6.69	2.02	16.3	0.58	17.6	83.6	Clear	None
15:30	5	10	100	64.10	0.26	6.7	1.94	10.6	0.46	17.6	83.1	Clear	None
15:35	5	15	100	64.08	0.40	6.71	1.89	8.85	0.56	18.9	82.2	Clear	None
15:40	5	20	100	64.05	0.53	6.7	1.89	5.72	0.58	19.2	82.3	Clear	None
15:45	5	25	100	64.05	0.66	6.69	1.92	4.92	0.6	19.4	82	Clear	None
15:50	5	30	100	64.05	0.79	6.69	1.96	4.67	0.57	19.3	82.2	Clear	None
15:55	5	35	100	64.05	0.92	6.69	1.98	4.44	0.54	19.6	81.8	Clear	None
16:00	5	40	100	64.05	1.06	6.69	2	4.38	0.53	20	81.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-126			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.55	**Total Depth (ft-bmp)**	75.45	**Water Column (ft)**	16.90	**Gallons in Well**	2.75
Purge Start	09:50	**Pump Intake (ft-bmp)**	72.95	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:50	**Volumes Purged**	1.06	**Sample ID**	MW-20-126_083023	**Sampled by**	Donald Richmond
Sample Time	10:50	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	DUP-05_083023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	200	58.55	0.79	7.03	3.2	204	12.31	14.2	70.1	Clear	None
10:10	5	5	200	58.55	1.06	7.05	3.19	107	10.46	14.1	79.3	Clear	None
10:15	5	10	200	58.55	1.32	7.07	3.22	100	9.9	14.5	80.6	Clear	None
10:20	5	15	200	58.55	1.59	7.23	2.96	59.5	9.79	14.4	80.2	Clear	None
10:25	5	20	200	58.55	1.85	7.26	3.05	61.4	9.91	14.4	78.7	Clear	None
10:30	5	25	200	58.55	2.11	7.3	3.01	52.4	10.21	14.7	77.9	Clear	None
10:35	5	30	200	58.55	2.38	7.39	3.17	58.2	9.56	15.5	74.3	Clear	None
10:40	5	35	200	58.55	2.64	7.41	3.21	51.1	9.4	15.6	69.9	Clear	None
10:45	5	40	200	58.55	2.91	7.45	3.2	52.8	9.61	15.3	66.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-127			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.77	**Total Depth (ft-bmp)**	78.68	**Water Column (ft)**	12.91	**Gallons in Well**	2.10
Purge Start	11:45	**Pump Intake (ft-bmp)**	76.18	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:35	**Volumes Purged**	1.01	**Sample ID**	MW-20-127_083023	**Sampled by**	Donald Richmond
Sample Time	12:30	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:55	0	0	200	65.77	0.53	6.8	2.92	13	0.74	16.9	52.7	Clear	None
12:00	5	5	200	65.77	0.79	6.66	3.01	12.4	0.67	16.8	37.5	Clear	None
12:05	5	10	200	65.77	1.06	6.53	3.11	8.9	0.46	17	31.8	Clear	None
12:10	5	15	200	65.77	1.32	6.63	3.11	4.58	0.47	17.1	24.4	Clear	None
12:15	5	20	200	65.77	1.59	6.63	3.13	5.24	0.34	17.2	22.2	Clear	None
12:20	5	25	200	65.77	1.85	6.62	3.15	3.39	0.34	17.3	18.2	Clear	None
12:25	5	30	200	65.77	2.11	6.63	3.15	3.11	0.32	17.4	16.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-129			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Cloudy. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.47	**Total Depth (ft-bmp)**	70.95	**Water Column (ft)**	9.48	**Gallons in Well**	1.54
Purge Start	12:55	**Pump Intake (ft-bmp)**	68.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:25	**Volumes Purged**	0.51	**Sample ID**	MW-20-129_082923	**Sampled by**	Billy Cobern
Sample Time	13:25	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	100	61.47	0.00	0	0	0	0	0	0	Clear	None
13:00	5	5	100	61.70	0.13	6.98	1.93	18.5	0.68	18.3	100	Clear	None
13:05	5	10	100	61.70	0.26	6.99	1.95	13.7	0.67	19.7	97.2	Clear	None
13:10	5	15	100	61.70	0.40	6.99	1.97	11.6	0.68	20.6	95.9	Clear	None
13:15	5	20	100	61.70	0.05	6.99	1.99	9.99	0.71	21.1	94.7	Clear	None
13:20	5	25	100	61.70	0.66	6.99	2	9.45	0.72	21.2	94.1	Clear	None
13:25	5	30	100	61.70	0.79	6.99	2	9.61	0.71	21.2	93.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-131			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Mostly Cloudy. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.58	**Total Depth (ft-bmp)**	8.65	**Water Column (ft)**	3.07	**Gallons in Well**	0.50
Purge Start	11:55	**Pump Intake (ft-bmp)**	7.65	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:25	**Volumes Purged**	3.17	**Sample ID**	MW-20-131_082923	**Sampled by**	Austin Westhuis
Sample Time	12:20	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	200	5.60	0.26	7.14	4.12	2.94	0.16	19.9	-2.5	Clear	None
12:05	5	5	200	5.60	0.53	7.12	4.13	2.09	0.14	20	-11	Clear	None
12:10	5	10	200	5.60	0.79	7.11	4.13	1.61	0.16	19.9	-13.5	Clear	None
12:15	5	15	200	5.60	1.06	7.1	4.13	1.44	0.15	19.9	-15.2	Clear	None
12:20	5	20	200	5.60	1.32	7.1	4.11	1.22	0.16	19.8	-17.4	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-132			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Cloudy. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.62	**Total Depth (ft-bmp)**	10.8	**Water Column (ft)**	5.18	**Gallons in Well**	0.84
Purge Start	12:40	**Pump Intake (ft-bmp)**	8.3	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:20	**Volumes Purged**	2.52	**Sample ID**	MW-20-132_082923	**Sampled by**	Austin Westhuis
Sample Time	13:10	**Gallons Purged**	2.113376	**Replicate/ Code No.**	MW-20-132_082923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:45	0	0	200	5.62	0.26	7.04	5.08	6.49	0.19	16.9	-12.4	Clear	None
12:50	5	5	200	5.62	0.53	7.03	4.96	3.36	0.21	17.2	-20.2	Clear	None
12:55	5	10	200	5.62	0.79	7.03	4.9	1.71	0.21	17.1	-32.2	Clear	None
13:00	5	15	200	5.62	1.06	7.03	4.85	1.49	0.2	17.1	-42.1	Clear	None
13:05	5	20	200	5.62	1.32	7.02	4.84	1.33	0.21	17.2	-47.9	Clear	None
13:10	5	25	200	5.62	1.59	7.02	4.8	1.09	0.21	17.2	-49.6	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	9	HCL

Comments: MS/MSD collected here.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-143			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Clear. The wind is blowing N/NE at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.76	**Total Depth (ft-bmp)**	31	**Water Column (ft)**	13.24	**Gallons in Well**	2.15
Purge Start	12:05	**Pump Intake (ft-bmp)**	28.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:45	**Volumes Purged**	0.49	**Sample ID**	MW-22-143_082823	**Sampled by**	Billy Cobern
Sample Time	12:45	**Gallons Purged**	1.056688	**Replicate/ Code No.**	DUP-01_082823	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	100	17.76	0.00	0	0	0	0	0	0	Clear	None
12:10	5	5	100	17.90	0.13	6.98	2.8	29.8	0.34	16.3	129.4	Clear	None
12:15	5	10	100	17.91	0.26	7	2.8	25.2	0.32	16.4	122.7	Clear	None
12:20	5	15	100	17.91	0.40	7.01	2.8	18.9	0.3	16.2	119	Clear	None
12:25	5	20	100	17.91	0.53	7.02	2.79	15.5	0.36	16.2	116.1	Clear	None
12:30	5	25	100	17.91	0.66	7.03	2.8	12.7	0.29	16.2	111.4	Clear	None
12:35	5	30	100	17.91	0.79	7.03	2.8	10.2	0.26	16	109	Clear	None
12:40	5	35	100	17.91	0.92	7.03	2.8	9.98	0.24	16	108.6	Clear	None
12:45	5	40	100	17.91	1.06	7.03	2.8	9.87	0.25	16	108.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-144			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.9 degrees F and Mostly Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.20	**Total Depth (ft-bmp)**	24.5	**Water Column (ft)**	11.30	**Gallons in Well**	1.84
Purge Start	15:30	**Pump Intake (ft-bmp)**	22	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:00	**Volumes Purged**	0.43	**Sample ID**	MW-22-144_082823	**Sampled by**	Billy Cobern
Sample Time	16:00	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:30	0	0	100	13.20	0.00	0	0	0	0	0	0	Clear	None
15:35	5	5	100	13.60	0.13	7.07	1.34	18.5	0.35	17.6	92.8	Clear	None
15:40	5	10	100	13.55	0.26	7.08	1.34	13.7	0.26	17.9	90.9	Clear	None
15:45	5	15	100	13.53	0.40	7.09	1.32	11.8	0.28	17.9	87.6	Clear	None
15:50	5	20	100	13.51	0.53	7.08	1.3	9.89	0.27	17.9	87.8	Clear	None
15:55	5	25	100	13.50	0.66	7.08	1.3	9.71	0.27	17.9	87.7	Clear	None
16:00	5	30	100	13.50	0.79	7.08	1.29	9.47	0.27	17.6	87.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-145			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.9 degrees F and Clear. The wind is blowing at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.00	**Total Depth (ft-bmp)**	15.5	**Water Column (ft)**	2.50	**Gallons in Well**	0.41
Purge Start	14:25	**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:10	**Volumes Purged**	2.90	**Sample ID**	MW-22-145_082823	**Sampled by**	Billy Cobern
Sample Time	15:10	**Gallons Purged**	1.188774	**Replicate/ Code No.**	MW-22-145_082823	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	100	13.00	0.00	0	0	0	0	0	0	Clear	None
14:30	5	5	100	13.10	0.13	7.07	1.11	22.8	0.98	18.1	74.3	Clear	None
14:35	5	10	100	13.10	0.26	7.05	1.12	15.8	0.62	17.8	78.1	Clear	None
14:40	5	15	100	13.10	0.40	7.05	1.14	12.8	0.65	17.8	80.5	Clear	None
14:45	5	20	100	13.10	0.53	7.06	1.16	10.4	0.5	17.9	81	Clear	None
14:50	5	25	100	13.10	0.66	7.06	1.17	9	0.46	17.6	81.9	Clear	None
14:55	5	30	100	13.10	0.79	7.06	1.18	8.59	0.42	17.7	82.3	Clear	None
15:00	5	35	100	13.10	0.92	7.06	1.19	7.92	0.41	17.6	82.7	Clear	None
15:05	5	40	100	13.10	1.06	7.06	1.19	7.47	0.4	17.6	82.7	Clear	None
15:10	5	45	100	13.10	1.19	7.06	1.19	7.31	0.42	17.7	82.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	6	None

Comments: MS/MSD collected here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-146			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.88	**Total Depth (ft-bmp)**	10.5	**Water Column (ft)**	2.62	**Gallons in Well**	0.43
Purge Start	16:25	**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:55	**Volumes Purged**	1.84	**Sample ID**	MW-22-146_082823	**Sampled by**	Billy Cobern
Sample Time	16:55	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:25	0	0	100	7.88	0.00	0	0	0	0	0	0	Clear	None
16:30	5	5	100	8.09	0.13	7.19	0.89	10.9	1.59	16.9	74.9	Clear	None
16:35	5	10	100	8.09	0.26	7.19	0.89	8.19	2.09	16.9	73.9	Clear	None
16:40	5	15	100	8.09	0.40	7.2	0.89	9.23	2.63	17.1	72.7	Clear	None
16:45	5	20	100	8.09	0.53	7.18	0.89	8.89	3.41	16.9	72.6	Clear	None
16:50	5	25	100	8.09	0.66	7.18	0.89	8.4	3.65	16.9	72.1	Clear	None
16:55	5	30	100	8.09	0.79	7.18	0.89	8.13	3.67	16.8	72	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-147			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Clear. The wind is blowing N/NE at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.41	**Total Depth (ft-bmp)**	12.23	**Water Column (ft)**	2.82	**Gallons in Well**	0.46
Purge Start	12:35	**Pump Intake (ft-bmp)**	11.23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:10	**Volumes Purged**	4.02	**Sample ID**	MW-22-147_082823	**Sampled by**	Austin Westhuis
Sample Time	13:05	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:40	0	0	200	9.94	0.26	6.87	1.24	31.3	8.67	16.7	67.4	Clear	None
12:45	5	5	200	9.94	0.53	6.87	1.24	12.6	8.21	16.7	58.6	Clear	None
12:50	5	10	200	9.94	0.79	6.86	1.25	7.88	8.06	16.8	58.9	Clear	None
12:55	5	15	200	9.94	1.06	6.88	1.25	4.39	7.82	16.7	59.6	Clear	None
13:00	5	20	200	9.94	1.32	6.89	1.25	4.09	7.58	16.7	60.2	Clear	None
13:05	5	25	200	9.94	1.59	6.9	1.26	3.59	7.51	16.7	60.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-148			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.0 degrees F and Clear. The wind is blowing E/NE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.26	**Total Depth (ft-bmp)**	29.3	**Water Column (ft)**	5.04	**Gallons in Well**	0.82
Purge Start	13:25	**Pump Intake (ft-bmp)**	28.3	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:55	**Volumes Purged**	1.93	**Sample ID**	MW-22-148_082823	**Sampled by**	Austin Westhuis
Sample Time	13:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	200	24.94	0.26	6.99	0.75	12.2	0.33	14.7	52.3	Clear	None
13:35	5	5	200	25.31	0.53	6.98	0.75	6.59	2.07	14.6	59.6	Clear	None
13:40	5	10	200	25.39	0.79	6.98	0.75	5.39	1.91	14.5	61.4	Clear	None
13:45	5	15	200	25.45	1.06	6.97	0.74	4.95	1.86	14.4	61.8	Clear	None
13:50	5	20	200	25.49	1.32	6.97	0.74	4.95	1.86	14.4	61.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-149			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.9 degrees F and Clear. The wind is blowing at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.84	**Total Depth (ft-bmp)**	9.91	**Water Column (ft)**	4.07	**Gallons in Well**	0.66
Purge Start	14:25	**Pump Intake (ft-bmp)**	8.91	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:55	**Volumes Purged**	2.40	**Sample ID**	MW-22-149_082823	**Sampled by**	Austin Westhuis
Sample Time	14:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	200	5.87	0.26	7.18	0.489	4.98	4.68	18.3	69.7	Clear	None
14:35	5	5	200	5.87	0.53	7.14	0.487	4.12	4.84	18.5	69.4	Clear	None
14:40	5	10	200	5.87	0.79	7.12	0.495	2.71	4.9	18.7	73.9	Clear	None
14:45	5	15	200	5.87	1.06	7.12	0.5	2.34	5.13	18.7	76	Clear	None
14:50	5	20	200	5.87	1.32	7.12	0.51	2.03	5.25	18.6	78.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-150			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.9 degrees F and Mostly Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.82	**Total Depth (ft-bmp)**	17.94	**Water Column (ft)**	12.12	**Gallons in Well**	1.97
Purge Start	15:20	**Pump Intake (ft-bmp)**	15.44	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:55	**Volumes Purged**	0.94	**Sample ID**	MW-22-150_082823	**Sampled by**	Austin Westhuis
Sample Time	15:50	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:25	0	0	200	6.47	0.26	7.25	3.8	49	0.45	17.1	49.9	Clear	None
15:30	5	5	200	6.78	0.53	7.22	3.81	41.9	0.26	17.5	25.3	Clear	None
15:35	5	10	200	7.03	0.79	7.22	3.79	37.5	0.25	17.3	22.3	Clear	None
15:40	5	15	200	7.41	1.06	7.21	3.74	33.9	0.24	17.1	11.7	Clear	None
15:45	5	20	200	7.81	1.32	7.21	3.76	31.2	0.24	17.3	8.7	Clear	None
15:50	5	25	200	8.05	1.59	7.21	3.78	30.9	0.23	17.3	6.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-151			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.54	**Total Depth (ft-bmp)**	14.92	**Water Column (ft)**	8.38	**Gallons in Well**	1.36
Purge Start	16:15	**Pump Intake (ft-bmp)**	12.42	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:50	**Volumes Purged**	1.36	**Sample ID**	MW-22-151_082823	**Sampled by**	Austin Westhuis
Sample Time	16:45	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:20	0	0	200	6.96	0.26	6.8	2.21	304	0.17	17.9	-40	Clear	None
16:25	5	5	200	7.21	0.53	6.78	2.19	112	0.17	18	-42.2	Clear	None
16:30	5	10	200	7.29	0.79	6.77	2.18	42.3	0.17	17.9	-44.3	Clear	None
16:35	5	15	200	7.34	1.06	6.77	2.17	18.1	0.18	17.9	-45.1	Clear	None
16:40	5	20	200	7.33	1.32	6.78	2.17	17.8	0.18	18	-47.2	Clear	None
16:45	5	25	200	7.33	1.59	6.78	2.15	16.5	0.18	18.1	-49.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-152			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing W/NW at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.91	**Total Depth (ft-bmp)**	14.9	**Water Column (ft)**	6.99	**Gallons in Well**	1.14
Purge Start	17:15	**Pump Intake (ft-bmp)**	12.4	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:45	**Volumes Purged**	1.39	**Sample ID**	MW-22-152_082823	**Sampled by**	Austin Westhuis
Sample Time	17:40	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
17:20	0	0	200	8.01	0.26	6.77	0.86	9.1	0.2	16.9	26.8	Clear	None
17:25	5	5	200	8.03	0.53	6.73	0.86	3.38	0.18	16.8	29.5	Clear	None
17:30	5	10	200	8.03	0.79	6.73	0.86	3.03	0.18	16.7	30.1	Clear	None
17:35	5	15	200	8.03	1.06	6.74	0.85	2.61	0.18	16.6	30.2	Clear	None
17:40	5	20	200	8.04	1.32	6.75	0.85	2.03	0.18	16.5	30.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-153			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.33	**Total Depth (ft-bmp)**	31.16	**Water Column (ft)**	20.83	**Gallons in Well**	3.38
Purge Start	13:10	**Pump Intake (ft-bmp)**	28.66	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:50	**Volumes Purged**	0.47	**Sample ID**	MW-22-153_082923	**Sampled by**	Donald Richmond
Sample Time	13:45	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	10.33	0.00	6.98	1.26	26.5	0.24	18.2	-16.1	Clear	None
13:20	5	5	200	10.33	0.00	6.97	1.25	15.1	0.19	17.6	-31.5	Clear	None
13:25	5	10	200	10.33	0.00	6.97	1.25	11.3	0.14	17.8	-39.9	Clear	None
13:30	5	15	200	10.33	0.00	7	1.25	12.1	0.2	17.7	-45.5	Clear	None
13:35	5	20	200	10.33	0.00	7.03	1.26	12	0.19	17.8	-51.4	Clear	None
13:40	5	25	200	10.33	0.00	7.03	1.25	12.6	0.19	17.6	-55.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-154			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	66.9 degrees F and Clear. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.49	**Total Depth (ft-bmp)**	10.58	**Water Column (ft)**	5.09	**Gallons in Well**	0.83
Purge Start	10:30	**Pump Intake (ft-bmp)**	8.08	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:05	**Volumes Purged**	2.23	**Sample ID**	MW-22-154_082923	**Sampled by**	Austin Westhuis
Sample Time	11:00	**Gallons Purged**	1.849204	**Replicate/ Code No.**	DUP-03_082923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	200	5.51	0.26	6.75	9.76	3.35	0.27	15.8	79.8	Clear	None
10:40	5	5	200	5.51	0.53	6.77	9.6	2.82	0.28	15.9	61.5	Clear	None
10:45	5	10	200	5.51	0.79	6.78	9.27	2.14	0.33	15.9	45.5	Clear	None
10:50	5	15	200	5.51	1.06	6.78	9.31	1.91	0.36	15.9	41.1	Clear	None
10:55	5	20	200	5.51	1.32	6.78	9.38	1.64	0.37	15.9	39.2	Clear	None
11:00	5	25	200	5.51	1.59	6.78	9.49	1.55	0.37	15.9	37	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	6	HCL

Comments: DUP-03_082923 collected here.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure.
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-155			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.63	**Total Depth (ft-bmp)**	31.5	**Water Column (ft)**	19.87	**Gallons in Well**	3.23
Purge Start	11:50	**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:25	**Volumes Purged**	0.41	**Sample ID**	MW-22-155_082923	**Sampled by**	Donald Richmond
Sample Time	12:20	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	200	11.63	0.79	6.88	1.9	98	2.04	20.1	-45.5	Clear	None
12:10	5	5	200	11.63	1.06	6.94	1.94	102	1.96	20.5	-53.6	Clear	None
12:15	5	10	200	11.63	1.32	6.91	1.88	107	2	19	-53.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-156			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.79	**Total Depth (ft-bmp)**	31.04	**Water Column (ft)**	18.25	**Gallons in Well**	2.97
Purge Start	14:00	**Pump Intake (ft-bmp)**	28.54	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:35	**Volumes Purged**	0.44	**Sample ID**	MW-22-156_082923	**Sampled by**	Donald Richmond
Sample Time	14:30	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:05	0	0	200	12.79	0.26	7.16	1.15	4.42	0.27	17.5	-32.6	Clear	None
14:10	5	5	200	12.79	0.53	7.11	1.15	4.81	0.16	17.3	-43.1	Clear	None
14:15	5	10	200	12.79	0.79	7.11	1.15	5.34	0.1	17.6	-51.1	Clear	None
14:20	5	15	200	12.79	1.06	7.14	1.15	6.09	0.07	17.5	-55.5	Clear	None
14:25	5	20	200	12.79	1.32	7.14	1.15	10.2	0.07	17.4	-57.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-157			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.37	**Total Depth (ft-bmp)**	27.61	**Water Column (ft)**	25.24	**Gallons in Well**	4.10
Purge Start	10:10	**Pump Intake (ft-bmp)**	25.11	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:15	**Volumes Purged**	0.71	**Sample ID**	MW-22-157_082923	**Sampled by**	Donald Richmond
Sample Time	11:10	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	DUP-06_082923	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	200	2.37	0.53	6.87	1.25	1.43	0.5	19.6	134.4	Clear	None
10:25	5	5	200	2.37	0.79	6.87	1.22	1.86	0.43	18.5	126.6	Clear	None
10:30	5	10	200	2.37	1.06	6.87	1.23	5.96	0.39	18.5	113.5	Clear	None
10:35	5	15	200	2.37	1.32	6.88	1.26	8.82	0.3	18.8	105.2	Clear	None
10:40	5	20	200	2.37	1.59	6.81	1.39	25.5	0.16	18.4	51.6	Clear	None
10:45	5	25	200	2.37	1.85	6.81	1.45	26.6	0.14	18.4	15.6	Clear	None
10:50	5	30	200	2.37	2.11	6.84	1.46	21.7	0.13	18.2	-17.7	Clear	None
10:55	5	35	200	2.37	2.38	6.86	1.45	18.8	0.12	18.3	-29.1	Clear	None
11:00	5	40	200	2.37	2.64	6.88	1.44	16.5	0.11	18.2	-30.8	Clear	None
11:05	5	45	200	2.37	2.91	6.9	1.44	15.1	0.1	18.4	-34.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-158			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.0 degrees F and Clear. The wind is blowing E/NE at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.63	**Total Depth (ft-bmp)**	21	**Water Column (ft)**	6.37	**Gallons in Well**	1.04
Purge Start	13:15	**Pump Intake (ft-bmp)**	18.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:00	**Volumes Purged**	1.14	**Sample ID**	MW-22-158_082823	**Sampled by**	Billy Cobern
Sample Time	14:00	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	100	14.63	0.00	0	0	0	0	0	0	Clear	None
13:20	5	5	100	14.75	0.13	7.02	4.62	14.2	0.36	16.6	134.3	Clear	None
13:25	5	10	100	14.77	0.26	7.03	4.58	9.74	0.32	16.6	130.1	Clear	None
13:30	5	15	100	14.79	0.40	7.04	4.44	8.79	0.39	16.4	126.7	Clear	None
13:35	5	20	100	14.79	0.53	7.05	3.99	7.82	0.24	16.6	121.8	Clear	None
13:40	5	25	100	14.79	0.66	7.05	3.51	7.59	0.2	16.3	117.2	Clear	None
13:45	5	30	100	14.79	0.79	7.05	3.39	7.05	0.19	16.4	116.7	Clear	None
13:50	5	35	100	14.79	0.92	7.05	3.37	7.14	0.15	16.4	116.1	Clear	None
13:55	5	40	100	14.79	1.06	7.05	3.37	6.89	0.16	16.3	116	Clear	None
14:00	5	45	100	14.79	1.19	7.05	3.37	7.32	0.16	16.3	115.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-160			**Date**	8/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	75.9 degrees F and Clear. The wind is blowing W/NW at 5.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.53	**Total Depth (ft-bmp)**	19	**Water Column (ft)**	4.47	**Gallons in Well**	0.73
Purge Start	17:20	**Pump Intake (ft-bmp)**	17	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:45	**Volumes Purged**	0.90	**Sample ID**	MW-22-160_082823	**Sampled by**	Billy Cobern
Sample Time	17:45	**Gallons Purged**	0.6604301	**Replicate/ Code No.**	DUP-02_082823	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
17:20	0	0	100	14.53	0.00	0	0	0	0	0	0	Clear	None
17:25	5	5	100	14.57	0.13	6.81	1.28	10.9	0.85	16.9	67.6	Clear	None
17:30	5	10	100	14.57	0.26	6.83	1.28	7.91	0.73	16.7	64.6	Clear	None
17:35	5	15	100	14.57	0.40	6.83	1.28	6.24	0.87	16.6	64.4	Clear	None
17:40	5	20	100	14.57	0.53	6.83	1.28	6.41	0.88	16.6	63.6	Clear	None
17:45	5	25	100	14.57	0.66	6.83	1.28	6.09	0.85	16.7	63.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Off site
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-02			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.10	**Total Depth (ft-bmp)**	85.25	**Water Column (ft)**	19.15	**Gallons in Well**	3.11
Purge Start	13:15	**Pump Intake (ft-bmp)**	82.75	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:40	**Volumes Purged**	0.34	**Sample ID**	PW-14-02_083023	**Sampled by**	Donald Richmond
Sample Time	13:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	200	66.10	0.26	7.78	1.89	2.08	10.14	16.9	57.6	Clear	None
13:25	5	5	200	66.10	0.53	7.76	1.87	1.89	9.79	16.6	61.8	Clear	None
13:30	5	10	200	66.10	0.79	7.78	1.87	1.52	9.11	16.7	64.1	Clear	None
13:35	5	15	200	66.10	1.06	7.79	1.86	1.22	9.11	16.7	65.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-03R			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Partly Cloudy. The wind is blowing N at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	72.45	**Total Depth (ft-bmp)**	94.29	**Water Column (ft)**	21.84	**Gallons in Well**	3.55
Purge Start	11:20	**Pump Intake (ft-bmp)**	91.79	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:00	**Volumes Purged**	0.60	**Sample ID**	PW-14-03R_083023	**Sampled by**	Austin Westhuis
Sample Time	11:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:25	0	0	200	72.45	0.26	5.72	3.4	893	8.5	16.9	0.3	Clear	None
11:30	5	5	200	72.45	0.53	5.49	3.32	611	8.22	15.7	62.8	Clear	None
11:35	5	10	200	72.45	0.79	5.47	3.32	371	7.9	15.7	76.5	Clear	None
11:40	5	15	200	72.45	1.06	5.47	3.33	303	7.78	15.8	79.6	Clear	None
11:45	5	20	200	72.45	1.32	5.47	3.32	278	7.41	15.9	88.5	Clear	None
11:50	5	25	200	72.45	1.59	5.46	3.32	261	7.34	15.8	91.4	Clear	None
11:55	5	30	200	72.45	1.85	5.46	3.32	254	7.3	15.8	93.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: See figure

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-02			**Date**	8/29/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.0 degrees F and Cloudy. The wind is blowing W/SW at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.03	**Total Depth (ft-bmp)**	70.5	**Water Column (ft)**	10.47	**Gallons in Well**	1.70
Purge Start	14:00	**Pump Intake (ft-bmp)**	68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:50	**Volumes Purged**	0.78	**Sample ID**	TW-14-02_082923	**Sampled by**	Billy Cobern
Sample Time	14:50	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:00	0	0	100	60.03	0.00	0	0	0	0	0	0	Clear	None
14:05	5	5	100	60.30	0.13	6.61	4.74	25.6	0.53	17	102	Clear	None
14:10	5	10	100	60.30	0.26	6.62	4.69	23	0.25	17.1	101.1	Clear	None
14:15	5	15	100	60.30	0.40	6.63	4.72	17.8	0.24	17.9	100.1	Clear	None
14:20	5	20	100	60.30	0.53	6.63	4.76	14.8	0.52	18.4	99.9	Clear	None
14:25	5	25	100	60.30	0.66	6.62	4.77	11.3	0.53	18.4	100	Clear	None
14:30	5	30	100	60.30	0.79	6.62	4.75	10.4	0.46	17.6	100.5	Clear	None
14:35	5	35	100	60.30	0.92	6.62	4.73	8.52	0.38	17.7	100.6	Clear	None
14:40	5	40	100	60.30	1.06	6.62	4.74	7.94	0.33	18.1	100.5	Clear	None
14:45	5	45	100	60.30	1.19	6.62	4.75	7.62	0.32	18.1	100.6	Clear	None
14:50	5	50	100	60.30	1.32	6.61	4.76	7.36	0.32	18.1	100.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-06			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Clear. The wind is blowing N/NW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.35	**Total Depth (ft-bmp)**	85.55	**Water Column (ft)**	27.20	**Gallons in Well**	4.42
Purge Start	13:55	**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:25	**Volumes Purged**	0.18	**Sample ID**	TW-14-06_083023	**Sampled by**	Billy Cobern
Sample Time	14:25	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	DUP-04_083023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:55	0	0	100	58.35	0.00	0	0	0	0	0	0	Brown	None
14:00	5	5	100	58.35	0.13	7.49	1.95	48.5	11.67	17.3	88	Brown	None
14:05	5	10	100	58.35	0.26	7.49	1.96	32.3	10.64	17.8	85.4	Brown	None
14:10	5	15	100	58.35	0.40	7.45	1.94	48.7	10.53	17	86.9	Brown	None
14:15	5	20	100	58.35	0.53	7.47	1.95	46	10.02	17.1	88	Brown	None
14:20	5	25	100	58.35	0.66	7.46	1.94	44.6	10.27	17.1	88.6	Brown	None
14:25	5	30	100	58.35	0.79	7.46	1.94	43.2	10.31	17	90.1	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments: Well being influenced by remediation system

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-11			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Mostly Clear. The wind is blowing N at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.65	**Total Depth (ft-bmp)**	86.9	**Water Column (ft)**	18.25	**Gallons in Well**	2.97
Purge Start	13:00	**Pump Intake (ft-bmp)**	84	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:30	**Volumes Purged**	0.27	**Sample ID**	TW-15-11_083023	**Sampled by**	Billy Cobern
Sample Time	13:30	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	100	68.65	0.00	0	0	0	0	15	0	Clear	None
13:05	5	5	100	68.85	0.13	7.28	3.32	14.9	10	19.2	110.8	Clear	None
13:10	5	10	100	68.85	0.26	7.19	3.37	12	9.64	18.5	110.5	Clear	None
13:15	5	15	100	68.85	0.40	7.16	3.38	9.82	10.18	17.8	108.8	Clear	None
13:20	5	20	100	68.85	0.53	7.19	3.34	8.78	10.28	17.2	107.7	Clear	None
13:25	5	25	100	68.85	0.66	7.19	3.31	8.52	10.25	17.1	106.2	Clear	None
13:30	5	30	100	68.85	0.79	7.19	3.33	8.13	10.15	16.8	105.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-12			**Date**	8/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.92	**Total Depth (ft-bmp)**	76.95	**Water Column (ft)**	12.03	**Gallons in Well**	1.95
Purge Start	14:15	**Pump Intake (ft-bmp)**	74.45	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:45	**Volumes Purged**	0.54	**Sample ID**	TW-15-12_083023	**Sampled by**	Donald Richmond
Sample Time	14:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:20	0	0	200	64.92	0.26	7.61	2.18	126	9.37	17.1	78.1	Clear	None
14:25	5	5	200	64.92	0.53	7.57	2.17	118	9.55	16.9	76.8	Clear	None
14:30	5	10	200	64.92	0.79	7.57	2.17	114	9.37	16.9	77	Clear	None
14:35	5	15	200	64.92	1.06	7.58	2.16	108	8.86	17	74.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	CH-14-RO			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	50.0 degrees F and Cloudy. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.80	**Total Depth (ft-bmp)**	14.81	**Water Column (ft)**	8.01	**Gallons in Well**	1.30
Purge Start	12:50	**Pump Intake (ft-bmp)**	12.31	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:25	**Volumes Purged**	1.42	**Sample ID**	CH-14-RO_110423	**Sampled by**	Austin Westhuis
Sample Time	13:20	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	200	7.09	0.26	7.2	0.98	6.91	0.51	15.7	134.1	Clear	None
13:00	5	5	200	7.09	0.53	7.22	0.98	3.99	0.39	15.9	128.2	Clear	None
13:05	5	10	200	7.09	0.79	7.22	0.98	3.81	0.32	15.9	126.7	Clear	None
13:10	5	15	200	7.09	1.06	7.22	0.981	3.11	0.28	15.9	124.6	Clear	None
13:15	5	20	200	7.09	1.32	7.22	0.981	2.84	0.27	15.9	123.7	Clear	None
13:20	5	25	200	7.09	1.59	7.22	0.989	2.44	0.26	16	122.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-02-02(6)			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.70	**Total Depth (ft-bmp)**	43.4	**Water Column (ft)**	14.70	**Gallons in Well**	2.39
Purge Start	11:05	**Pump Intake (ft-bmp)**	41.4	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:10	**Volumes Purged**	1.22	**Sample ID**	MW-02-02(6)_103023	**Sampled by**	Donald Richmond
Sample Time	12:05	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:15	0	0	200	78.16	0.53	6.7	2.652	22	3.56	9.2	173	Clear	None
11:25	10	10	200	78.16	1.06	6.75	3.459	7.64	1.23	9	66.7	Clear	None
11:35	10	20	200	78.16	1.59	6.77	4.186	5.14	0.06	10.1	8.3	Clear	None
11:40	5	25	200	78.16	1.85	6.8	4.078	4.62	0.36	9.8	7.9	Clear	None
11:45	5	30	200	78.16	2.11	6.82	3.992	4.64	0.56	9.5	9.8	Clear	None
11:50	5	35	200	78.16	2.38	6.81	4.07	4.17	0	8.8	-0.9	Clear	None
11:55	5	40	200	78.16	2.64	6.81	4.137	4.61	-0.16	9.2	-11.7	Clear	None
12:00	5	45	200	78.16	2.91	6.82	4.203	5.67	0	9.4	-18.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-02-04(3)			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.41	**Total Depth (ft-bmp)**	84	**Water Column (ft)**	22.59	**Gallons in Well**	3.67
Purge Start	15:50	**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:50	**Volumes Purged**	0.79	**Sample ID**	MW-02-04(3)_110223	**Sampled by**	Donald Richmond
Sample Time	16:50	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:05	0	0	200	61.41	0.79	6.86	3.286	86	0.25	13.2	113.1	Clear	None
16:10	5	5	200	61.41	1.06	6.88	3.319	89	0.1	13.1	99	Clear	None
16:15	5	10	200	61.41	1.32	6.88	3.337	91	0.04	13.2	90.5	Clear	None
16:20	5	15	200	61.41	1.59	6.88	3.339	92	0	13	79.3	Clear	None
16:25	5	20	200	61.41	1.85	6.88	3.341	101	0	12.8	60.6	Clear	None
16:30	5	25	200	61.41	2.11	6.88	3.349	110	0	12.8	49	Clear	None
16:35	5	30	200	61.41	2.38	6.88	3.367	130	0	12.9	40.2	Clear	None
16:40	5	35	200	61.41	2.64	6.87	3.413	157	0	13.1	24.3	Clear	None
16:45	5	40	200	61.41	2.91	6.87	3.406	193	0	12.8	11.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-03-05			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.64	**Total Depth (ft-bmp)**	47.94	**Water Column (ft)**	25.30	**Gallons in Well**	4.11
Purge Start	12:40	**Pump Intake (ft-bmp)**	45.94	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:50	**Volumes Purged**	0.71	**Sample ID**	MW-03-05_103023	**Sampled by**	Donald Richmond
Sample Time	13:40	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	DUP-11_103023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:45	0	0	200	22.64	0.26	7.97	1.45	82	0.65	12.5	52.7	Clear	None
12:50	5	5	200	22.64	0.53	7.92	1.45	78	0.42	12.4	-21	Clear	None
12:55	5	10	200	22.64	0.79	7.91	1.452	56	0.55	12.4	-48.5	Clear	None
13:00	5	15	200	22.64	1.06	7.89	1.429	36	0.36	11.8	-55.4	Clear	None
13:05	5	20	200	22.64	1.32	7.87	1.411	30	0.22	11.3	-61.1	Clear	None
13:10	5	25	200	22.64	1.59	7.85	1.379	23.37	0.03	10.5	-69	Clear	None
13:15	5	30	200	22.64	1.85	7.84	1.37	20	0	10.4	-72.5	Clear	None
13:20	5	35	200	22.64	2.11	7.83	1.372	14.64	0	10.5	-77	Clear	None
13:25	5	40	200	22.64	2.38	7.81	1.429	20	0	11.9	-82	Clear	None
13:30	5	45	200	22.64	2.64	7.82	1.432	22	0	11.7	-86.5	Clear	None
13:35	5	50	200	22.64	2.91	7.81	1.373	21	0	10.3	-96.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-03-06			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	35.75	**Total Depth (ft-bmp)**	40.58	**Water Column (ft)**	4.83	**Gallons in Well**	0.78
Purge Start	14:15	**Pump Intake (ft-bmp)**	38.58	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:20	**Volumes Purged**	3.39	**Sample ID**	MW-03-06_103023	**Sampled by**	Donald Richmond
Sample Time	15:10	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	200	35.75	0.79	6.71	6.86	91	0	10.7	28	Clear	None
14:35	5	5	200	35.75	1.06	6.73	6.832	78	0	10.6	4.4	Clear	None
14:40	5	10	200	35.75	1.32	6.73	7.01	56	0	11.4	-9.8	Clear	None
14:45	5	15	200	35.75	1.59	6.73	7.07	38.76	0	11.6	-17.7	Clear	None
14:50	5	20	200	35.75	1.85	6.74	7.113	22	0	11.4	-24	Clear	None
14:55	5	25	200	35.75	2.11	6.74	7.056	16.06	0	11.2	-26.8	Clear	None
15:00	5	30	200	35.75	2.38	6.74	6.906	15	0	10.6	-29.2	Clear	None
15:05	5	35	200	35.75	2.64	6.73	6.88	15	0	10.6	-32.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-04-04R			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	76.92	**Total Depth (ft-bmp)**	111.05	**Water Column (ft)**	34.13	**Gallons in Well**	22.18
Purge Start	15:50	**Pump Intake (ft-bmp)**	109	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	17:00	**Volumes Purged**	0.13	**Sample ID**	MW-04-04R_103023	**Sampled by**	Donald Richmond
Sample Time	16:50	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:00	0	0	200	76.92	0.53	7.27	0.82	57	0.51	8.3	-95	Clear	None
16:05	5	5	200	76.92	0.79	7.16	0.834	58	0.13	8.7	-115.5	Clear	None
16:10	5	10	200	76.92	1.06	7.15	0.838	58	0.09	8.5	-115	Clear	None
16:15	5	15	200	76.92	1.32	7.06	0.86	56	0	7.6	-105.6	Clear	None
16:20	5	20	200	76.92	1.59	7	0.888	43	0	7.8	-92.6	Clear	None
16:25	5	25	200	76.92	1.85	6.98	0.911	33	0	8.3	-82	Clear	None
16:30	5	30	200	76.92	2.11	6.97	0.907	27.31	0	8.2	-76.4	Clear	None
16:35	5	35	200	76.92	2.38	6.96	0.914	25	0	8.3	-74.1	Clear	None
16:40	5	40	200	76.92	2.64	6.96	0.898	22	0	8	-71.8	Clear	None
16:45	5	45	200	76.92	2.91	6.96	0.892	23	0	7.9	-70.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-04-05(6)			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.80	**Total Depth (ft-bmp)**	29.6	**Water Column (ft)**	20.80	**Gallons in Well**	3.38
Purge Start	11:55	**Pump Intake (ft-bmp)**	27.6	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:35	**Volumes Purged**	0.47	**Sample ID**	MW-04-05(6)_103123	**Sampled by**	Donald Richmond
Sample Time	12:30	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	200	8.80	0.26	7.49	2.005	4.26	0.15	12.5	-39.1	Clear	None
12:05	5	5	200	8.80	0.53	7.48	2.025	3.84	0	12.9	-60	Clear	None
12:10	5	10	200	8.80	0.79	7.48	2.03	3.76	0	13.1	-69.7	Clear	None
12:15	5	15	200	8.80	1.06	7.47	2.047	4.24	0	13.5	-78	Clear	None
12:20	5	20	200	8.80	1.32	7.47	2.038	5.06	0	13.2	-86.4	Clear	None
12:25	5	25	200	8.80	1.59	7.46	2.058	8.52	0	13.3	-87.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-04-06R			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	66.31	**Total Depth (ft-bmp)**	77.79	**Water Column (ft)**	11.48	**Gallons in Well**	7.46
Purge Start	09:15	**Pump Intake (ft-bmp)**	75.79	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:05	**Volumes Purged**	0.25	**Sample ID**	MW-04-06R_103123	**Sampled by**	Donald Richmond
Sample Time	09:55	**Gallons Purged**	1.849204	**Replicate/ Code No.**	DUP-14_103123	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	200	66.31	0.79	7.4	3.954	34.55	0.25	9.2	-163.3	Clear	None
09:35	5	5	200	66.31	1.06	7.39	4.059	36.5	0.12	9.5	-169	Clear	None
09:40	5	10	200	66.31	1.32	7.41	4.177	43	0	9.6	-175.7	Clear	None
09:45	5	15	200	66.31	1.59	7.42	4.216	47.79	0	9.7	-178.8	Clear	None
09:50	5	20	200	66.31	1.85	7.43	4.216	49	0	9.3	-181.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-05R			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	75.23	**Total Depth (ft-bmp)**	112.3	**Water Column (ft)**	37.07	**Gallons in Well**	6.02
Purge Start	09:20	**Pump Intake (ft-bmp)**	110.3	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:55	**Volumes Purged**	0.22	**Sample ID**	MW-12-05R_102523	**Sampled by**	Donald Richmond
Sample Time	09:50	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	200	75.23	0.79	10.01	0.428	42	2.03	16.7	136	Clear	None
09:40	5	5	200	75.23	1.06	9.98	0.428	41	1.22	16.7	130.6	Clear	None
09:45	5	10	200	75.23	1.32	9.97	0.429	35	0.97	16.7	125.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-06			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	74.67	**Total Depth (ft-bmp)**	103.57	**Water Column (ft)**	28.90	**Gallons in Well**	4.70
Purge Start	10:35	**Pump Intake (ft-bmp)**	101.57	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:05	**Volumes Purged**	0.22	**Sample ID**	MW-12-06_102523	**Sampled by**	Donald Richmond
Sample Time	11:00	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	200	74.67	0.53	7.37	0.732	29	8.7	15.5	23.1	Clear	None
10:50	5	5	200	74.67	0.79	7.38	0.726	29	8.95	15.4	21.2	Clear	None
10:55	5	10	200	74.67	1.06	7.4	0.723	28	8.95	15.5	17.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-09			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Mostly Clear. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.05	**Total Depth (ft-bmp)**	21.6	**Water Column (ft)**	9.55	**Gallons in Well**	1.55
Purge Start	13:00	**Pump Intake (ft-bmp)**	19.1	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:50	**Volumes Purged**	1.70	**Sample ID**	MW-12-09_102623	**Sampled by**	Austin Westhuis
Sample Time	13:45	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:05	0	0	200	12.05	0.26	7.21	2.098	1131.74	0.31	17.2	-89.2	Clear	None
13:10	5	5	200	12.05	0.53	7.21	2.063	836.16	0.24	17.2	-92.2	Clear	None
13:15	5	10	200	12.05	0.79	7.21	2.019	466.83	0.18	17.2	-92.4	Clear	None
13:20	5	15	200	12.05	1.06	7.21	1.99	247.62	0.16	17.2	-93.6	Clear	None
13:25	5	20	200	12.05	1.32	7.22	1.69	177.57	0.15	17.1	-94.8	Clear	None
13:30	5	25	200	12.05	1.59	7.22	1.803	155.44	0.14	17.2	-95.9	Clear	None
13:35	5	30	200	12.05	1.85	7.22	1.948	138.89	0.14	17.2	-96.1	Clear	None
13:40	5	35	200	12.05	2.11	7.22	1.937	136.6	0.14	17.2	-96.3	Clear	None
13:45	5	40	200	12.05	2.38	7.22	1.925	131.58	0.14	17.2	-96.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-10R			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing W at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.40	**Total Depth (ft-bmp)**	17.95	**Water Column (ft)**	6.55	**Gallons in Well**	1.06
Purge Start	16:50	**Pump Intake (ft-bmp)**	15.45	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:40	**Volumes Purged**	2.49	**Sample ID**	MW-12-10R_103023	**Sampled by**	Austin Westhuis
Sample Time	17:30	**Gallons Purged**	2.641721	**Replicate/ Code No.**	DUP-12_103023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:55	0	0	200	11.84	0.26	6.86	3.81	4.38	0.42	11.6	31.1	Clear	None
17:00	5	5	200	11.84	0.53	6.87	3.79	4.09	0.34	11.4	24.6	Clear	None
17:05	5	10	200	11.84	0.79	6.88	3.863	3.72	0.28	11.1	24.6	Clear	None
17:10	5	15	200	11.84	1.06	6.87	3.945	3.52	0.24	11.3	25.3	Clear	None
17:15	5	20	200	11.84	1.32	6.87	4.124	3.44	0.22	11.1	27.2	Clear	None
17:20	5	25	200	11.84	1.59	6.86	4.238	3.22	0.19	11.1	28.5	Clear	None
17:25	5	30	200	11.84	1.85	6.86	4.335	3.01	0.19	11.1	29.8	Clear	None
17:30	5	35	200	11.84	2.11	6.86	4.365	2.74	0.19	11.1	30.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-11			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.43	**Total Depth (ft-bmp)**	16.79	**Water Column (ft)**	10.36	**Gallons in Well**	1.68
Purge Start	14:20	**Pump Intake (ft-bmp)**	14.79	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:50	**Volumes Purged**	0.63	**Sample ID**	MW-12-11_103123	**Sampled by**	Donald Richmond
Sample Time	14:45	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	200	6.43	0.26	6.74	3.414	11	0.36	13.2	13	Clear	None
14:30	5	5	200	6.43	0.53	6.73	3.49	11	0	13.2	-34	Clear	None
14:35	5	10	200	6.43	0.79	6.7	3.737	11	0	13.2	-40	Clear	None
14:40	5	15	200	6.43	1.06	6.7	3.745	15	0	13.2	-42.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-12			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.79	**Total Depth (ft-bmp)**	17.2	**Water Column (ft)**	11.41	**Gallons in Well**	1.85
Purge Start	10:30	**Pump Intake (ft-bmp)**	15.2	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:35	**Volumes Purged**	1.57	**Sample ID**	MW-12-12_110123	**Sampled by**	Donald Richmond
Sample Time	11:30	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	200	5.79	0.53	7.34	1.118	7.43	0.33	14.4	159.6	Clear	None
10:45	5	5	200	5.79	0.79	7.39	1.075	6.25	0.2	14.7	154.2	Clear	None
10:50	5	10	200	5.79	1.06	7.4	1.042	5.34	0.32	14.8	152.2	Clear	None
10:55	5	15	200	5.79	1.32	7.4	0.996	5.24	1.23	14.9	151.7	Clear	None
11:00	5	20	200	5.79	1.59	7.38	0.916	5.49	2.09	14.7	156.4	Clear	None
11:05	5	25	200	5.79	1.85	7.38	0.913	5	1.71	14.6	162.1	Clear	None
11:10	5	30	200	5.79	2.11	7.38	0.914	5.09	1.59	14.4	163	Clear	None
11:15	5	35	200	5.79	2.38	7.38	0.931	4.79	1.12	14.6	165	Clear	None
11:20	5	40	200	5.79	2.64	7.38	0.93	6.09	1.21	14.8	165.1	Clear	None
11:25	5	45	200	5.79	2.91	7.39	0.925	6.52	1.08	14.3	166.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-13			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Mostly Clear. The wind is blowing SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.00	**Total Depth (ft-bmp)**	25.45	**Water Column (ft)**	15.45	**Gallons in Well**	2.51
Purge Start	13:35	**Pump Intake (ft-bmp)**	22.95	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:05	**Volumes Purged**	0.63	**Sample ID**	MW-12-13_103123	**Sampled by**	Austin Westhuis
Sample Time	14:00	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	200	11.40	0.26	7.56	0.703	9.46	0.72	10.1	-86.5	Clear	None
13:45	5	5	200	11.78	0.53	7.54	0.692	5.72	0.33	10.5	-93.9	Clear	None
13:50	5	10	200	11.88	0.79	7.55	0.678	4.32	0.3	10.3	-97.9	Clear	None
13:55	5	15	200	11.90	1.06	7.55	0.675	4.01	0.29	10.1	-98.4	Clear	None
14:00	5	20	200	11.90	1.32	7.55	0.665	3.91	0.29	10	-99.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-18			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	62.1 degrees F and Mostly Cloudy. The wind is blowing S at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.77	**Total Depth (ft-bmp)**	34.8	**Water Column (ft)**	12.03	**Gallons in Well**	1.95
Purge Start	11:40	**Pump Intake (ft-bmp)**	32.3	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:30	**Volumes Purged**	1.35	**Sample ID**	MW-12-18_102623	**Sampled by**	Austin Westhuis
Sample Time	12:25	**Gallons Purged**	2.641721	**Replicate/ Code No.**	DUP-02_102623	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	200	22.77	0.26	7.04	2.871	205.55	0.35	13.5	-73.1	Clear	None
11:50	5	5	200	22.77	0.53	7.06	2.786	79.67	0.27	13.4	-69.2	Clear	None
11:55	5	10	200	22.77	0.79	7.11	2.746	67.14	0.33	13.4	-68.5	Clear	None
12:00	5	15	200	22.77	1.06	7.11	2.762	60.66	0.35	13.4	-68	Clear	None
12:05	5	20	200	22.77	1.32	7.1	2.782	42.1	0.34	13.4	-67.5	Clear	None
12:10	5	25	200	22.77	1.59	7.09	2.803	39.72	0.3	13.4	-66.9	Clear	None
12:15	5	30	200	22.77	1.85	7.09	2.807	38.82	0.29	13.4	-66.5	Clear	None
12:20	5	35	200	22.77	2.11	7.09	2.823	36.91	0.28	13.4	-66.4	Clear	None
12:25	5	40	200	22.77	2.38	7.09	2.832	35.59	0.27	13.4	-66	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-12-21			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	37.9 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.22	**Total Depth (ft-bmp)**	78.1	**Water Column (ft)**	11.88	**Gallons in Well**	1.93
Purge Start	14:45	**Pump Intake (ft-bmp)**	75.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:15	**Volumes Purged**	0.41	**Sample ID**	MW-12-21_110123	**Sampled by**	Billy Cobern
Sample Time	15:15	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	MW-12-21_110123	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	100	66.55	0.13	6.65	1.803	40.94	0.91	11.6	-46.7	Clear	None
14:55	5	5	100	66.55	0.26	6.67	1.756	57.52	0.64	10	-58.7	Clear	None
15:00	5	10	100	66.55	0.40	6.67	1.742	55.63	0.52	10.5	-63.5	Clear	None
15:05	5	15	100	66.55	0.53	6.67	1.728	60.58	0.46	9.8	-65.5	Clear	None
15:10	5	20	100	66.55	0.66	6.65	1.719	60.99	0.45	10.1	-64.5	Clear	None
15:15	5	25	100	66.55	0.79	6.65	1.719	59.89	0.45	10.1	-64.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments: Breathing zone during sampling 0ppm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-22			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.62	**Total Depth (ft-bmp)**	96.15	**Water Column (ft)**	26.53	**Gallons in Well**	4.31
Purge Start	15:40	**Pump Intake (ft-bmp)**	93.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:20	**Volumes Purged**	0.25	**Sample ID**	MW-13-22_110123	**Sampled by**	Billy Cobern
Sample Time	16:20	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:45	0	0	100	69.88	0.13	7.14	0.918	25.93	5.84	10.1	69.5	Clear	None
15:50	5	5	100	69.88	0.26	6.67	1.799	8.22	2.24	11.3	81.2	Clear	None
15:55	5	10	100	69.88	0.40	6.62	1.816	9.51	0.51	12	84.3	Clear	None
16:00	5	15	100	69.88	0.53	6.62	1.806	9.52	0.37	12.1	84.1	Clear	None
16:05	5	20	100	69.88	0.66	6.62	1.808	9.61	0.28	12.1	82.3	Clear	None
16:10	5	25	100	69.88	0.79	6.62	1.809	9.99	0.24	11.9	75.8	Clear	None
16:15	5	30	100	69.88	0.92	6.64	1.803	9.74	0.23	12	69.9	Clear	None
16:20	5	35	100	69.88	1.06	6.64	1.807	9.49	0.23	12	67.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-23			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.55	**Total Depth (ft-bmp)**	77.5	**Water Column (ft)**	10.95	**Gallons in Well**	1.78
Purge Start	09:35	**Pump Intake (ft-bmp)**	75.0	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:40	**Volumes Purged**	1.63	**Sample ID**	MW-13-23_110223	**Sampled by**	Donald Richmond
Sample Time	10:35	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:45	0	0	200	66.55	0.53	6.74	1.142	287	8.82	10.2	203.9	Clear	None
09:50	5	5	200	66.55	0.79	6.77	1.173	252	8.58	11.1	210.8	Clear	None
09:55	5	10	200	66.55	1.06	6.78	1.197	298	8.43	11.4	214	Clear	None
10:00	5	15	200	66.55	1.32	6.77	1.167	671	8.81	11	224	Clear	None
10:05	5	20	200	66.55	1.59	6.79	1.177	681	8.17	11.3	227.9	Clear	None
10:10	5	25	200	66.55	1.85	6.8	1.19	485	8.21	11.6	231.7	Clear	None
10:20	10	35	200	66.55	2.38	6.86	1.178	273	8.23	11.1	237.5	Clear	None
10:25	5	40	200	66.55	2.64	6.82	1.19	240	8.23	11.5	241	Clear	None
10:30	5	45	200	66.55	2.91	6.83	1.199	150	8.19	11.4	244	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-25			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.10	**Total Depth (ft-bmp)**	75	**Water Column (ft)**	9.90	**Gallons in Well**	1.61
Purge Start	11:15	**Pump Intake (ft-bmp)**	72.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:00	**Volumes Purged**	0.98	**Sample ID**	MW-13-25_110223	**Sampled by**	Donald Richmond
Sample Time	11:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	200	65.10	0.79	6.5	1.148	15	4.57	10.8	145.4	Clear	None
11:35	5	5	200	65.10	1.06	6.54	1.141	11.77	5.11	10.9	108.2	Clear	None
11:40	5	10	200	65.10	1.32	6.55	1.134	10.8	5.14	10.9	107.2	Clear	None
11:45	5	15	200	65.10	1.59	6.57	1.133	8.7	5.44	11.3	109.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-27			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.69	**Total Depth (ft-bmp)**	75.7	**Water Column (ft)**	10.01	**Gallons in Well**	1.63
Purge Start	15:15	**Pump Intake (ft-bmp)**	72.2	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:10	**Volumes Purged**	1.46	**Sample ID**	MW-13-27_110123	**Sampled by**	Donald Richmond
Sample Time	16:05	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:30	0	0	200	65.69	0.79	6.67	1.471	34	0.9	10.7	10.4	Clear	None
15:35	5	5	200	65.69	1.06	6.68	1.513	30	0.35	10.8	-7.3	Clear	None
15:40	5	10	200	65.69	1.32	6.68	1.53	27	0.25	10.8	-14.6	Clear	None
15:45	5	15	200	65.69	1.59	6.69	1.542	17.23	0.06	10.9	-35.8	Clear	None
15:50	5	20	200	65.69	1.85	6.69	1.562	14	0	10.7	-45.2	Clear	None
15:55	5	25	200	65.69	2.11	6.7	1.578	11.6	0	11	-51.4	Clear	None
16:00	5	30	200	65.69	2.38	6.7	1.588	11.4	0	10.9	-55.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-28			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	28.9 degrees F and Mostly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	70.30	**Total Depth (ft-bmp)**	114.75	**Water Column (ft)**	44.45	**Gallons in Well**	7.22
Purge Start	11:40	**Pump Intake (ft-bmp)**	112	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:40	**Volumes Purged**	0.22	**Sample ID**	MW-13-28_110123	**Sampled by**	Billy Cobern
Sample Time	12:40	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	100	70.50	0.13	9.71	0.231	45.08	4.48	12.8	22.4	Clear	None
11:50	5	5	100	70.55	0.26	9.44	0.241	28.11	2.87	12.6	27	Clear	None
11:55	5	10	100	70.55	0.40	9.09	0.258	23.38	0.94	12.1	5	Clear	None
12:00	5	15	100	70.55	0.53	8.92	0.262	20.8	0.49	11.4	-62.5	Clear	None
12:05	5	20	100	70.55	0.66	8.84	0.266	18.88	0.33	11.5	-128.7	Clear	None
12:10	5	25	100	70.55	0.79	8.8	0.267	17.61	0.26	11.6	-161.4	Clear	None
12:15	5	30	100	70.55	0.92	8.75	0.271	15.12	0.2	11.4	-194.5	Clear	None
12:20	5	35	100	70.55	1.06	8.67	0.281	12.54	0.16	11.5	-223.2	Clear	None
12:25	5	40	100	70.55	1.19	8.61	0.286	11.04	0.13	11.4	-242	Clear	None
12:30	5	45	100	70.55	1.32	8.56	0.29	10.53	0.11	11.5	-251.3	Clear	None
12:35	5	50	100	70.55	1.45	8.51	0.294	10.55	0.09	11.4	-261.7	Clear	None
12:40	5	55	100	70.55	1.59	8.48	0.296	10.43	0.07	11.5	-266	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	2	HCL

Comments: Stabilization criteria not met.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Well Locked at Arrival: yes
Condition of Well: Good condition
Well Locked at Departure: yes
Well Completion: Stick-up
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-29			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Light Rain. The wind is blowing S at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.15	**Total Depth (ft-bmp)**	76.3	**Water Column (ft)**	12.15	**Gallons in Well**	1.97
Purge Start	09:15	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**	0.60	**Sample ID**	MW-13-29_102623	**Sampled by**	Billy Cobern
Sample Time	10:00	**Gallons Purged**	1.188774	**Replicate/ Code No.**	DUP-10_102623	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:20	0	0	100	64.30	0.13	6.13	3.361	4.65	3.8	15.6	167.5	Clear	None
09:25	5	5	100	64.30	0.26	6.12	3.35	4.18	3.08	15.5	166.8	Clear	None
09:30	5	10	100	64.30	0.40	6.12	3.345	4.78	2.73	15.5	166.4	Clear	None
09:35	5	15	100	64.30	0.53	6.11	3.338	5.63	2.62	15.4	165.1	Clear	None
09:40	5	20	100	64.30	0.66	6.12	3.333	8.51	2.47	15.3	159.2	Clear	None
09:45	5	25	100	64.30	0.79	6.12	3.33	8.12	2.4	15.3	153.7	Clear	None
09:50	5	30	100	64.30	0.92	6.12	3.329	9.62	2.37	15.3	151.6	Clear	None
09:55	5	35	100	64.30	1.06	6.12	3.329	9.17	2.35	15.2	150.5	Clear	None
10:00	5	40	100	64.30	1.19	6.12	3.33	9.04	2.34	15.2	150.2	Clear	None

Constituent Sampled	Container	Number	Preservative
TKN/Total Phosphorus	250 mL Plastic	2	H2SO4
Nitrate	125 mL Plastic	2	None
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments: Breathing zone 0ppm during sampling

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-34			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.48	**Total Depth (ft-bmp)**	79.9	**Water Column (ft)**	13.42	**Gallons in Well**	2.18
Purge Start	10:05	**Pump Intake (ft-bmp)**	77.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:55	**Volumes Purged**	0.61	**Sample ID**	MW-13-34_110223	**Sampled by**	Billy Cobern
Sample Time	10:55	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	100	66.79	0.13	7.13	2.114	39.43	4.1	11.3	48.3	Clear	None
10:15	5	5	100	66.80	0.26	6.85	2.138	23.85	0.68	11.7	51.3	Clear	None
10:20	5	10	100	66.80	0.40	6.84	2.155	20.95	0.48	11.5	21.5	Clear	None
10:25	5	15	100	66.80	0.53	6.85	2.186	26.15	0.39	11.5	-15.4	Clear	None
10:30	5	20	100	66.80	0.66	6.85	2.233	28.2	0.32	11.4	-45.9	Clear	None
10:35	5	25	100	66.80	0.79	6.84	2.283	18.51	0.26	11.5	-68.2	Clear	None
10:40	5	30	100	66.80	0.92	6.83	2.288	17.3	0.24	11.5	-76.8	Clear	None
10:45	5	35	100	66.80	1.06	6.83	2.29	20.15	0.22	11.8	-80.7	Clear	None
10:50	5	40	100	66.80	1.19	6.82	2.297	20.9	0.21	11.7	-84	Clear	None
10:55	5	45	100	66.80	1.32	6.82	2.998	21.1	0.21	11.7	-86.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-36R			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	35.1 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.48	**Total Depth (ft-bmp)**	12.7	**Water Column (ft)**	8.22	**Gallons in Well**	1.34
Purge Start	12:15	**Pump Intake (ft-bmp)**	10.2	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:45	**Volumes Purged**	1.18	**Sample ID**	MW-13-36R_103123	**Sampled by**	Austin Westhuis
Sample Time	12:40	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:20	0	0	200	4.48	0.26	12.09	1.921	9.33	0.88	12.6	-47.4	Clear	None
12:25	5	5	200	4.48	0.53	12.17	1.968	6.71	0.5	12.7	-66.2	Clear	None
12:30	5	10	200	4.48	0.79	12.18	1.988	6.05	0.37	12.9	-80.1	Clear	None
12:35	5	15	200	4.48	1.06	12.21	1.987	5.89	0.35	12.8	-85.5	Clear	None
12:40	5	20	200	4.48	1.32	12.22	1.993	5.72	0.34	12.8	-88.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-43			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.0 degrees F and Cloudy. The wind is blowing W/NW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.50	**Total Depth (ft-bmp)**	77.8	**Water Column (ft)**	13.30	**Gallons in Well**	2.16
Purge Start	08:00	**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	08:45	**Volumes Purged**	0.55	**Sample ID**	MW-13-43_102823	**Sampled by**	Billy Cobern
Sample Time	08:45	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:05	0	0	100	64.80	0.13	6.74	2.69	453	10.8	13.3	153.5	Clear	None
08:10	5	5	100	64.80	0.26	6.73	2.706	441	10.6	13.3	162.3	Clear	None
08:15	5	10	100	64.80	0.40	6.74	2.716	419	10.53	12.4	171.6	Clear	None
08:20	5	15	100	64.80	0.53	6.74	2.709	403	10.5	12	175.2	Clear	None
08:25	5	20	100	64.80	0.66	6.74	2.7	369	10.46	13	179.5	Clear	None
08:30	5	25	100	64.80	0.79	6.74	2.705	406	10.34	11.9	186.5	Clear	None
08:35	5	30	100	64.80	0.92	6.74	2.7	399.66	10.25	12	191.7	Clear	None
08:40	5	35	100	64.80	1.06	6.74	2.702	401.71	10.19	12.1	192.4	Clear	None
08:45	5	40	100	64.80	1.19	6.74	2.706	395.7	10.2	12.1	196.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-44			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	79.25	**Total Depth (ft-bmp)**	119.05	**Water Column (ft)**	39.80	**Gallons in Well**	6.47
Purge Start	13:10	**Pump Intake (ft-bmp)**	117.05	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:35	**Volumes Purged**	0.33	**Sample ID**	MW-13-44_102523	**Sampled by**	Donald Richmond
Sample Time	14:25	**Gallons Purged**	2.113376	**Replicate/ Code No.**	DUP-06_102523	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	200	79.25	0.53	10.41	1.279	28	0.48	15.3	68.4	Clear	None
13:25	5	5	200	79.25	0.79	10.34	1.28	40	0.28	15.3	49.8	Clear	None
13:30	5	10	200	79.25	1.06	10.32	1.283	54	0.25	15.4	42	Clear	None
13:35	5	15	200	79.25	1.32	10.31	1.286	70	0.32	15.4	36.2	Clear	None
13:40	5	20	200	79.25	1.59	10.3	1.287	60	0.29	15.4	33.4	Clear	None
13:50	10	30	200	79.25	2.11	10.28	1.296	39.08	0.27	15.6	26.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments: Pump blew a fuse after 40 minutes. Replaced pump and took sample to make the lab.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-45			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.0 degrees F and Cloudy. The wind is blowing N/NW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.09	**Total Depth (ft-bmp)**	78.35	**Water Column (ft)**	12.26	**Gallons in Well**	1.99
Purge Start	09:10	**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**	0.66	**Sample ID**	MW-13-45_102823	**Sampled by**	Billy Cobern
Sample Time	10:00	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	100	66.40	0.13	7.26	0.694	92.79	8.73	11.9	109.3	Clear	None
09:20	5	5	100	66.40	0.26	6.51	1.458	72.42	1.14	13.4	-38.3	Clear	None
09:25	5	10	100	66.40	0.40	6.52	1.433	39.64	0.92	13.3	-41.4	Clear	None
09:30	5	15	100	66.40	0.53	6.49	1.453	30.62	0.45	13.3	-45.1	Clear	None
09:35	5	20	100	66.40	0.66	6.48	1.469	17.85	0.31	13.5	-47.7	Clear	None
09:40	5	25	100	66.40	0.79	6.47	1.478	13.45	0.23	13.4	-49.7	Clear	None
09:45	5	30	100	66.40	0.92	6.47	1.479	10.69	0.2	13.3	-51.1	Clear	None
09:50	5	35	100	66.40	1.06	6.47	1.479	9.08	0.19	13.3	-51.2	Clear	None
09:55	5	40	100	66.40	1.19	6.47	1.477	9.62	0.19	13.4	-51.7	Clear	None
10:00	5	45	100	66.40	1.32	6.47	1.478	9.17	0.19	13.4	-51.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-46			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.54	**Total Depth (ft-bmp)**	74.65	**Water Column (ft)**	11.11	**Gallons in Well**	1.81
Purge Start	12:55	**Pump Intake (ft-bmp)**	72.15	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:00	**Volumes Purged**	1.61	**Sample ID**	MW-13-46_110223	**Sampled by**	Donald Richmond
Sample Time	13:55	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	DUP-08_110223	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	200	63.54	0.26	6.84	1.682	59.11	3.55	13.1	147.2	Clear	None
13:05	5	5	200	63.54	0.53	6.81	1.667	58	2.74	12.6	148.6	Clear	None
13:10	5	10	200	63.54	0.79	6.79	1.681	58	2.51	12.9	149.3	Clear	None
13:15	5	15	200	63.54	1.06	6.67	1.757	70	0.92	13.2	40.3	Clear	None
13:20	5	20	200	63.54	1.32	6.66	1.805	52	0.48	13.4	-2	Clear	None
13:25	5	25	200	63.54	1.59	6.66	1.811	44	0.3	13.2	-14.1	Clear	None
13:30	5	30	200	63.54	1.85	6.66	1.823	39	0.18	13.5	-24.5	Clear	None
13:35	5	35	200	63.54	2.11	6.66	1.835	33	0.07	13.5	-33.9	Clear	None
13:40	5	40	200	63.54	2.38	6.65	1.848	27	0	13.5	-46.3	Clear	None
13:45	5	45	200	63.54	2.64	6.66	1.847	25	0	13.4	-49.9	Clear	None
13:50	5	50	200	63.54	2.91	6.66	1.841	24	0	13.2	-51.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-13-48			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.23	**Total Depth (ft-bmp)**	73.25	**Water Column (ft)**	17.02	**Gallons in Well**	2.77
Purge Start	09:00	**Pump Intake (ft-bmp)**	70.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:40	**Volumes Purged**	0.38	**Sample ID**	MW-13-48	**Sampled by**	Billy Cobern
Sample Time	09:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:05	0	0	100	56.53	0.13	6.57	3.012	109.31	1.86	11.5	4.7	Clear	None
09:10	5	5	100	56.50	0.26	6.55	2.999	91.67	0.71	11	-39.7	Clear	None
09:15	5	10	100	56.50	0.40	6.56	2.923	68.35	0.53	10.7	-55.4	Clear	None
09:20	5	15	100	56.50	0.53	6.56	2.896	45.08	0.46	10.7	-64.1	Clear	None
09:25	5	20	100	56.50	0.66	6.56	2.893	35.11	0.43	10.8	-67.6	Clear	None
09:30	5	25	100	56.50	0.79	6.56	2.891	32.48	0.41	10.8	-70.3	Clear	None
09:35	5	30	100	56.50	0.92	6.56	2.915	32.09	0.38	10.7	-72.4	Clear	None
09:40	5	35	100	56.50	1.06	6.56	2.922	31.43	0.39	10.8	-73.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-56			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing S/SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.07	**Total Depth (ft-bmp)**	75.75	**Water Column (ft)**	9.68	**Gallons in Well**	1.57
Purge Start	10:00	**Pump Intake (ft-bmp)**	73	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:45	**Volumes Purged**	0.76	**Sample ID**	MW-14-56_102723	**Sampled by**	Billy Cobern
Sample Time	10:45	**Gallons Purged**	1.188774	**Replicate/ Code No.**	DUP-04_102723	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	100	66.43	0.13	7.05	2.907	66.77	8.91	17.6	3.052	Clear	None
10:10	5	5	100	66.71	0.26	6.45	4.313	30.49	1.98	15.8	-14.5	Clear	None
10:15	5	10	100	66.80	0.40	6.47	4.252	27.69	1.71	15.9	-15.1	Clear	None
10:20	5	15	100	66.87	0.53	6.5	4.066	21.23	1.96	15.8	-4.4	Clear	None
10:25	5	20	100	66.93	0.66	6.52	3.946	17.36	2.18	15.8	1.8	Clear	None
10:30	5	25	100	66.98	0.79	6.51	3.965	13.87	2.11	15.9	2.4	Clear	None
10:35	5	30	100	67.02	1.06	6.5	3.991	10.31	1.76	15.9	-1.4	Clear	None
10:40	5	35	100	67.05	1.06	6.5	4.004	9.92	1.76	15.8	-2.4	Clear	None
10:45	5	40	100	67.08	1.19	6.5	4.011	9.94	1.72	15.8	-3.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL
PFAS	250mL HDPE Plastic	4	None

Comments: Did not measure TD (used historical). Didn't meet drawdown requirements. Bentonite in riser.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-57			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Mostly Clear. The wind is blowing S at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.52	**Total Depth (ft-bmp)**	21.38	**Water Column (ft)**	11.86	**Gallons in Well**	1.93
Purge Start	14:20	**Pump Intake (ft-bmp)**	18.88	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:00	**Volumes Purged**	1.10	**Sample ID**	MW-14-57_102623	**Sampled by**	Austin Westhuis
Sample Time	14:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	200	9.54	0.26	7.55	1.142	315.76	3.62	18.2	46.7	Clear	None
14:30	5	5	200	9.54	0.53	7.54	1.156	110.07	3.52	18.1	44.1	Clear	None
14:35	5	10	200	9.54	0.79	7.53	1.164	85.07	3.49	18.1	42.6	Clear	None
14:40	5	15	200	9.54	1.06	7.53	1.16	43.01	3.04	18.1	-6.8	Clear	None
14:45	5	20	200	9.54	1.32	7.53	1.153	42.71	3.01	18	-4.6	Clear	None
14:50	5	25	200	9.54	1.59	7.53	1.152	39.64	2.93	18	-0.9	Clear	None
14:55	5	30	200	9.54	1.85	7.53	1.152	38.89	2.9	18	2.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-58R			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.79	**Total Depth (ft-bmp)**	29.59	**Water Column (ft)**	16.80	**Gallons in Well**	2.73
Purge Start	12:00	**Pump Intake (ft-bmp)**	27.59	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:05	**Volumes Purged**	1.06	**Sample ID**	MW-14-58R_102423	**Sampled by**	Donald Richmond
Sample Time	13:00	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	200	12.79	0.26	7.17	2.648	7.69	0.27	17.3	-19.7	Clear	None
12:10	5	5	200	12.79	0.53	7.19	2.624	8.83	0.24	16.7	-68.2	Clear	None
12:15	5	10	200	12.79	0.79	7.1	2.589	11.68	0.18	16.7	-70.8	Clear	None
12:20	5	15	200	12.79	1.06	7.03	2.529	18.61	0.13	16.5	-68.1	Clear	None
12:25	5	20	200	12.79	1.32	6.99	2.516	19	0.11	16.4	-67	Clear	None
12:30	5	25	200	12.79	1.59	6.96	2.525	27	0.07	16.7	-68.1	Clear	None
12:35	5	30	200	12.79	1.85	6.95	2.512	27	0.06	16.5	-69.2	Clear	None
12:40	5	35	200	12.79	2.11	6.94	2.492	24	0.03	16.2	-70.9	Clear	None
12:45	5	40	200	12.79	2.38	6.92	2.492	16.52	0.01	16.3	-72.7	Clear	None
12:50	5	45	200	12.79	2.64	6.92	2.543	11	0	16.8	-75.5	Clear	None
12:55	5	50	200	12.79	2.91	6.92	2.545	9.94	0	16.8	-75.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Well Locked at Arrival: yes
Condition of Well: Good condition
Well Locked at Departure: yes
Well Completion: Stick-up
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-59			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Cloudy. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.82	**Total Depth (ft-bmp)**	19.33	**Water Column (ft)**	14.51	**Gallons in Well**	2.36
Purge Start	13:55	**Pump Intake (ft-bmp)**	16.83	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:30	**Volumes Purged**	0.78	**Sample ID**	MW-14-59_102523	**Sampled by**	Austin Westhuis
Sample Time	14:25	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:00	0	0	200	5.54	0.26	7.36	0.689	23.34	0.3	16.6	-34.3	Clear	None
14:05	5	5	200	5.54	0.53	7.35	0.692	12.16	0.23	16.5	-32.6	Clear	None
14:10	5	10	200	5.54	0.79	7.34	0.694	5.74	0.22	16.5	-35.5	Clear	None
14:15	5	15	200	5.54	1.06	7.34	0.694	2.7	0.21	16.5	-35.8	Clear	None
14:20	5	20	200	5.54	1.32	7.34	0.694	2.33	0.2	16.5	-39.4	Clear	None
14:25	5	25	200	5.54	1.59	7.34	0.694	2.12	0.2	16.5	-41.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-dioxane	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-60			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Light Rain. The wind is blowing S at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.19	**Total Depth (ft-bmp)**	22.45	**Water Column (ft)**	14.26	**Gallons in Well**	2.32
Purge Start	09:20	**Pump Intake (ft-bmp)**	19.95	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:00	**Volumes Purged**	0.91	**Sample ID**	MW-14-60_102623	**Sampled by**	Austin Westhuis
Sample Time	09:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:25	0	0	200	8.21	0.26	7.54	1.308	4.46	0.76	16.4	-103.7	Clear	None
09:30	5	5	200	8.21	0.53	7.52	1.327	4.11	0.39	16.4	-111.9	Clear	None
09:35	5	10	200	8.21	0.79	7.52	1.359	3.49	0.29	16.4	-115.8	Clear	None
09:40	5	15	200	8.21	1.06	7.52	1.384	3.09	0.24	16.4	-118.8	Clear	None
09:45	5	20	200	8.21	1.32	7.52	1.399	2.61	0.2	16.4	-122	Clear	None
09:50	5	25	200	8.21	1.59	7.52	1.391	2.14	0.19	16.4	-123.4	Clear	None
09:55	5	30	200	8.21	1.85	7.52	1.392	2.08	0.19	16.4	-125.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-dioxane	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-61			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.51	**Total Depth (ft-bmp)**	77.42	**Water Column (ft)**	8.91	**Gallons in Well**	1.45
Purge Start	09:10	**Pump Intake (ft-bmp)**	75.42	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:10	**Volumes Purged**	2.00	**Sample ID**	MW-14-61_102623	**Sampled by**	Donald Richmond
Sample Time	10:10	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:25	0	0	200	68.51	0.79	6.86	2.319	550	3.75	15.6	264.2	Clear	None
09:30	5	5	200	68.51	1.06	7.19	2.251	149	7.29	15.6	271.2	Clear	None
09:35	5	10	200	68.51	1.32	7.24	2.24	104.75	8.19	15.6	274.4	Clear	None
09:40	5	15	200	68.51	1.59	7.26	2.232	77	8.34	15.6	277.3	Clear	None
09:45	5	20	200	68.51	1.85	7.23	2.219	51	8.32	15.6	280.8	Clear	None
09:50	5	25	200	68.51	2.11	7.22	2.213	52	8.33	15.7	282.6	Clear	None
09:55	5	30	200	68.51	2.38	7.22	2.199	43	8.48	15.6	285	Clear	None
10:00	5	35	200	68.51	2.64	7.23	2.177	43	8.72	15.5	287.3	Clear	None
10:05	5	40	200	68.51	2.91	7.22	2.171	31	8.66	15.5	289	Clear	None

Constituent Sampled	Container	Number	Preservative
Total P, TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL
Nitrate/Nitrite	250 mL Plastic	1	None
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-62			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Mostly Cloudy. The wind is blowing S at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.08	**Total Depth (ft-bmp)**	19.64	**Water Column (ft)**	16.56	**Gallons in Well**	2.69
Purge Start	10:15	**Pump Intake (ft-bmp)**	17.14	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:55	**Volumes Purged**	0.79	**Sample ID**	MW-14-62_102623	**Sampled by**	Austin Westhuis
Sample Time	10:50	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	200	3.08	0.26	11.29	0.455	12.01	0.64	17.5	-226.9	Clear	None
10:25	5	5	200	3.08	0.53	11.3	0.469	6.04	0.33	17.6	-225.7	Clear	None
10:30	5	10	200	3.08	0.79	11.51	0.633	2.98	0.2	17.7	-250.7	Clear	None
10:35	5	15	200	3.08	1.06	11.54	0.662	2.44	0.17	17.7	-255.9	Clear	None
10:40	5	20	200	3.08	1.32	11.58	0.685	2.09	0.17	17.8	-263.2	Clear	None
10:45	5	25	200	3.08	1.59	11.59	0.69	1.79	0.16	17.8	-268.2	Clear	None
10:50	5	30	200	3.08	1.85	11.59	0.693	1.7	0.16	17.8	-268.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-dioxane	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-63			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.36	**Total Depth (ft-bmp)**	76.7	**Water Column (ft)**	8.34	**Gallons in Well**	1.36
Purge Start	08:25	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:25	**Volumes Purged**	1.17	**Sample ID**	MW-14-63_102723	**Sampled by**	Billy Cobern
Sample Time	09:25	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:30	0	0	100	68.89	0.13	6.96	1.21	1934	6.68	17	42.2	Brown	None
08:35	5	5	100	68.69	0.26	6.81	1.235	2054	2.78	16.1	-40.3	Brown	None
08:40	5	10	100	68.69	0.40	6.8	1.6	1976	1.46	15.9	-56.1	Brown	None
08:45	5	15	100	68.69	0.53	6.8	1.229	2021	0.89	15.8	-63.7	Brown	None
08:50	5	20	100	68.69	0.66	6.79	1.227	1991	0.71	15.8	-65.7	Brown	None
08:55	5	25	100	68.69	0.79	6.79	1.226	1917	0.61	15.8	-66.7	Brown	None
09:00	5	30	100	68.69	0.92	6.79	1.224	1861	0.6	15.7	-67.2	Brown	None
09:05	5	35	100	68.69	1.06	6.78	1.225	1802	0.65	15.7	-67.4	Brown	None
09:10	5	40	100	68.69	1.19	6.78	1.222	1752	0.5	15.6	-68	Brown	None
09:15	5	45	100	68.69	1.32	6.78	1.219	78.74	0.36	15.3	-68	Brown	None
09:20	5	50	100	68.69	1.45	6.78	1.22	74.2	0.34	15.2	-67.7	Brown	None
09:25	5	55	100	68.69	1.59	6.78	1.22	76.11	0.32	15.1	-67.6	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Drained and rinsed flow cell at 9:10 Turbidity stabilized at a value above 10 ntu.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-66			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing S at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.96	**Total Depth (ft-bmp)**	22.21	**Water Column (ft)**	18.25	**Gallons in Well**	2.97
Purge Start	09:20	**Pump Intake (ft-bmp)**	19.71	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:05	**Volumes Purged**	0.80	**Sample ID**	MW-14-66_103123	**Sampled by**	Austin Westhuis
Sample Time	10:00	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:25	0	0	200	5.89	0.26	7.69	0.811	6.09	1.45	12.7	-61.5	Clear	None
09:30	5	5	200	5.64	0.53	7.68	0.819	5.83	1.49	11.4	-58.1	Clear	None
09:35	5	10	200	5.64	0.79	7.68	0.823	5.01	1.36	11.4	-55	Clear	None
09:40	5	15	200	5.64	1.06	7.68	0.826	4.22	1.35	11.5	-53.9	Clear	None
09:45	5	20	200	5.64	1.32	7.67	0.835	3.98	1.18	11.7	-54.6	Clear	None
09:50	5	25	200	5.64	1.59	7.66	0.838	3.62	1.03	11.5	-56.1	Clear	None
09:55	5	30	200	5.64	1.85	7.65	0.84	3.26	1.01	11.6	-59.9	Clear	None
10:00	5	35	200	5.64	2.11	7.64	0.846	3.02	1	11.6	-61.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-67			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	35.1 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.11	**Total Depth (ft-bmp)**	20.83	**Water Column (ft)**	16.72	**Gallons in Well**	2.72
Purge Start	11:20	**Pump Intake (ft-bmp)**	18.33	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:05	**Volumes Purged**	0.87	**Sample ID**	MW-14-67_103123	**Sampled by**	Austin Westhuis
Sample Time	12:00	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:25	0	0	200	4.52	0.26	7.38	1.28	25.58	0.4	13.2	76.6	Clear	None
11:30	5	5	200	4.52	0.53	7.38	1.285	11.92	0.34	12.8	63.9	Clear	None
11:35	5	10	200	4.52	0.79	7.38	1.289	8.22	0.27	12.9	60.9	Clear	None
11:40	5	15	200	4.52	1.06	7.4	1.288	7.55	0.22	12.9	58.4	Clear	None
11:45	5	20	200	4.52	1.32	7.39	1.287	7.4	0.23	13.2	58.1	Clear	None
11:50	5	25	200	4.52	1.59	7.4	1.288	5.77	0.22	13.3	58.8	Clear	None
11:55	5	30	200	4.52	1.85	7.39	1.293	5.11	0.21	13.3	59.6	Clear	None
12:00	5	35	200	4.52	2.11	7.37	1.3	4.91	0.21	13.2	60.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-14-70			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.63	**Total Depth (ft-bmp)**	23.09	**Water Column (ft)**	12.46	**Gallons in Well**	2.02
Purge Start	12:55	**Pump Intake (ft-bmp)**	20.59	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:25	**Volumes Purged**	0.78	**Sample ID**	MW-14-70_103123	**Sampled by**	Austin Westhuis
Sample Time	13:20	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	200	10.80	0.26	7.34	1.41	26.01	1	11.9	73.6	Clear	None
13:05	5	5	200	11.80	0.53	7.29	1.395	10.35	0.35	10.3	77.5	Clear	None
13:10	5	10	200	11.84	0.79	7.29	1.395	9.56	0.3	10.3	75.7	Clear	None
13:15	5	15	200	11.84	1.06	7.29	1.394	8.79	0.29	10.4	74.9	Clear	None
13:20	5	20	200	11.84	1.32	7.3	1.408	8.57	0.29	10.4	75.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-15-72			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	71.1 degrees F and Mostly Cloudy. The wind is blowing SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.02	**Total Depth (ft-bmp)**	70.3	**Water Column (ft)**	13.28	**Gallons in Well**	2.16
Purge Start	14:20	**Pump Intake (ft-bmp)**	67.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:05	**Volumes Purged**	0.55	**Sample ID**	MW-15-72_102723	**Sampled by**	Billy Cobern
Sample Time	15:05	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	100	57.35	0.13	7.05	1.237	14.81	3.42	16.9	173.8	Clear	None
14:30	5	5	100	57.35	0.26	6.82	1.183	5.62	1.65	15.9	-17.2	Clear	None
14:35	5	10	100	57.35	0.40	6.75	1.188	8.51	1.31	16.7	-60.7	Clear	None
14:40	5	15	100	57.35	0.53	6.72	1.209	8.24	0.94	17.7	-72.6	Clear	None
14:45	5	20	100	57.35	0.66	6.71	1.26	7.63	0.5	17.7	-82.9	Clear	None
14:50	5	25	100	57.35	0.79	6.71	1.28	6.57	0.39	17.7	-88.7	Clear	None
14:55	5	30	100	57.35	0.92	6.7	1.287	6.89	0.29	17.8	-92.7	Clear	None
15:00	5	35	100	57.35	1.06	6.7	1.288	6.53	0.28	17.9	-93.6	Clear	None
15:05	5	40	100	57.35	1.19	6.7	1.289	6.23	0.28	17.9	-95.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250 mL Plastic	2	None

Comments: Breathing zone during sampling 0ppm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-74			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	73.0 degrees F and Partly Cloudy. The wind is blowing S/SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.64	**Total Depth (ft-bmp)**	73.65	**Water Column (ft)**	10.01	**Gallons in Well**	1.63
Purge Start	15:20	**Pump Intake (ft-bmp)**	71.15	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:10	**Volumes Purged**	1.46	**Sample ID**	MW-16-74_102723	**Sampled by**	Austin Westhuis
Sample Time	16:00	**Gallons Purged**	2.377548	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:25	0	0	200	64.20	0.26	6.91	2.323	718.11	0.58	15.9	-25.1	Clear	None
15:30	5	5	200	64.20	0.53	6.91	2.321	663.52	0.55	15.8	-26.7	Clear	None
15:35	5	10	200	64.20	0.79	6.9	2.319	536.48	0.52	15.9	-28.4	Clear	None
15:40	5	15	200	64.20	1.06	6.9	2.315	433.73	0.54	15.8	-29	Clear	None
15:45	5	20	200	64.20	1.32	6.9	2.313	387.35	0.57	15.8	-29.6	Clear	None
15:50	5	25	200	64.20	1.59	6.9	2.308	352.49	0.64	15.6	-29.4	Clear	None
15:55	5	30	200	64.20	1.85	6.9	2.306	344.67	0.63	15.6	-30.5	Clear	None
16:00	5	35	200	64.20	2.11	6.9	2.308	341.19	0.61	15.5	-31.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-75			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing N/NW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.54	**Total Depth (ft-bmp)**	74.1	**Water Column (ft)**	11.56	**Gallons in Well**	1.88
Purge Start	10:35	**Pump Intake (ft-bmp)**	71.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:35	**Volumes Purged**	0.84	**Sample ID**	MW-16-75_102823	**Sampled by**	Billy Cobern
Sample Time	11:35	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	62.83	0.13	6.95	2.008	741	3.87	14.2	-45.5	Clear	None
10:45	5	5	100	62.83	0.26	6.78	2.052	603	0.7	13.3	-68.7	Clear	None
10:50	5	10	100	62.83	0.40	6.79	2.035	501	0.63	13.6	-72.3	Clear	None
10:55	5	15	100	62.83	0.53	6.8	2.015	460	0.55	13.3	-75.5	Clear	None
11:00	5	20	100	62.83	0.66	6.81	1.99	494	0.48	13.3	-77.7	Clear	None
11:05	5	25	100	62.83	0.79	6.92	1.979	459	2.36	13.1	-65.6	Clear	None
11:10	5	30	100	62.83	0.92	6.82	1.97	455.09	0.6	13	-71	Clear	None
11:15	5	35	100	62.83	1.06	6.82	1.963	396.46	0.47	13	-74.5	Clear	None
11:20	5	40	100	62.83	1.19	6.83	1.956	350.36	0.43	12.9	-76	Clear	None
11:25	5	45	100	62.83	1.32	6.83	1.957	323.48	0.37	13	-77.7	Clear	None
11:30	5	50	100	62.83	1.45	6.82	1.961	272.63	0.31	13	-78.9	Clear	None
11:35	5	55	100	62.83	1.59	6.82	1.958	219.35	0.35	13.1	-79.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet stabilization requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-76			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	66.9 degrees F and Mostly Clear. The wind is blowing S at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.38	**Total Depth (ft-bmp)**	70.69	**Water Column (ft)**	5.31	**Gallons in Well**	0.86
Purge Start	16:10	**Pump Intake (ft-bmp)**	68.19	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:50	**Volumes Purged**	2.46	**Sample ID**	MW-16-76_102623	**Sampled by**	Austin Westhuis
Sample Time	16:45	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:15	0	0	200	67.71	0.26	8.05	2.323	319.13	11.47	13.9	83.6	Clear	None
16:20	5	5	200	67.71	0.53	7.88	2.452	261.1	9.97	13.9	41.5	Clear	None
16:25	5	10	200	67.73	0.79	7.58	2.559	209.41	9.25	13.8	-6.3	Clear	None
16:30	5	15	200	67.73	1.06	7.52	2.595	138.71	8.02	13.3	-35.4	Clear	None
16:35	5	20	200	67.75	1.32	7.56	2.582	131.94	7.64	13.5	-44	Clear	None
16:40	5	25	200	67.75	1.59	7.54	2.587	129.44	7.58	13.5	-43.7	Clear	None
16:45	5	30	200	67.75	1.85	7.51	2.591	122.05	7.57	13.5	-43.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-77			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing N at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.84	**Total Depth (ft-bmp)**	74	**Water Column (ft)**	12.16	**Gallons in Well**	1.98
Purge Start	12:05	**Pump Intake (ft-bmp)**	71.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:05	**Volumes Purged**	0.80	**Sample ID**	MW-16-77_102823	**Sampled by**	Billy Cobern
Sample Time	13:05	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:10	0	0	100	62.49	0.13	6.71	2.996	158.84	4.78	12.2	5.8	Clear	None
12:15	5	5	100	62.99	0.26	6.65	3.051	128.75	0.78	12.1	-34.1	Clear	None
12:20	5	10	100	63.45	0.40	6.65	3.049	107.48	0.61	12.5	-41	Clear	None
12:25	5	15	100	63.94	0.53	6.65	3.03	99.36	0.59	12.3	-41.8	Clear	None
12:30	5	20	100	64.41	0.66	6.71	3.016	81.31	2.45	11.8	-37.8	Clear	None
12:35	5	25	100	64.86	0.79	6.67	2.999	64.14	0.81	12.1	-36.5	Clear	None
12:40	5	30	100	65.21	0.92	6.67	2.998	58.48	0.82	11.9	-36.3	Clear	None
12:45	5	35	100	65.52	1.06	6.67	2.991	54.53	0.89	12.1	-35.7	Clear	None
12:50	5	40	100	65.86	1.19	6.68	2.994	47.45	0.97	12.4	-34.7	Clear	None
12:55	5	45	100	66.09	1.32	6.68	2.995	43.43	1.03	12.6	-33.6	Clear	None
13:00	5	50	100	66.36	1.45	6.68	2.993	41.42	1.06	12.5	-36.8	Clear	None
13:05	5	55	100	66.61	1.59	6.68	2.992	42.43	1.09	12.4	-37.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-78			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	48.9 degrees F and Mostly Cloudy. The wind is blowing N at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.16	**Total Depth (ft-bmp)**	76.2	**Water Column (ft)**	11.04	**Gallons in Well**	1.79
Purge Start	13:30	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:10	**Volumes Purged**	0.59	**Sample ID**	MW-16-78_102823	**Sampled by**	Billy Cobern
Sample Time	14:10	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:35	0	0	100	65.21	0.13	7.35	1.647	487.47	9.2	13.1	40.8	Clear	None
13:40	5	5	100	65.21	0.26	6.93	1.526	450.26	0.93	12.9	-49.5	Clear	None
13:45	5	10	100	65.21	0.40	6.93	1.525	272.37	2.68	13	-56.5	Clear	None
13:50	5	15	100	65.21	0.53	6.88	1.518	158.83	0.65	12.9	-60.6	Clear	None
13:55	5	20	100	65.21	0.66	6.87	1.515	143.44	0.65	12.9	-61.7	Clear	None
14:00	5	25	100	65.21	0.79	6.87	1.514	104.96	0.66	12.7	-62.2	Clear	None
14:05	5	30	100	65.21	0.92	6.87	1.512	103.96	0.67	12.7	-62.3	Clear	None
14:10	5	35	100	65.21	1.06	6.87	1.512	102.83	0.68	12.8	-62.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-80			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	48.9 degrees F and Mostly Cloudy. The wind is blowing N at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.95	**Total Depth (ft-bmp)**	73.33	**Water Column (ft)**	7.38	**Gallons in Well**	1.20
Purge Start	13:10	**Pump Intake (ft-bmp)**	70.83	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:50	**Volumes Purged**	1.76	**Sample ID**	MW-16-80_102823	**Sampled by**	Austin Westhuis
Sample Time	13:45	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	67.11	0.26	6.58	3.523	134.8	1.21	12.3	-20.1	Clear	None
13:20	5	5	200	67.11	0.53	6.58	3.582	109.41	0.74	12.3	-26.2	Clear	None
13:25	5	10	200	67.11	0.79	6.58	3.599	106.63	0.63	12.2	-29.5	Clear	None
13:30	5	15	200	67.11	1.06	6.58	3.621	102.04	0.51	12.2	-31.7	Clear	None
13:35	5	20	200	67.11	1.32	6.59	3.626	85.68	0.59	12.2	-33.2	Clear	None
13:40	5	25	200	67.11	1.59	6.6	3.61	83.31	0.55	12.2	-35.9	Clear	None
13:45	5	30	200	67.11	1.85	6.59	3.622	84.48	0.54	12.2	-36.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-81			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	68.0 degrees F and Cloudy. The wind is blowing SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.29	**Total Depth (ft-bmp)**	77.2	**Water Column (ft)**	11.91	**Gallons in Well**	1.94
Purge Start	13:00	**Pump Intake (ft-bmp)**	74.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:40	**Volumes Purged**	0.54	**Sample ID**	MW-16-81_102723	**Sampled by**	Billy Cobern
Sample Time	13:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:05	0	0	100	65.60	0.13	7.08	1.341	10.46	7.95	20.9	172.6	Clear	None
13:10	5	5	100	65.60	0.26	6.48	3.387	9.89	2.54	18.4	178.8	Clear	None
13:15	5	10	100	65.60	0.40	6.46	3.395	9.72	1.86	18.1	177.5	Clear	None
13:20	5	15	100	65.60	0.53	6.46	3.39	9.51	1.76	18.7	179.3	Clear	None
13:25	5	20	100	65.60	0.66	6.47	3.387	9.12	1.79	19.1	179.3	Clear	None
13:30	5	25	100	65.60	0.79	6.48	3.365	9.06	1.84	19.4	175.2	Clear	None
13:35	5	30	100	65.60	0.92	6.48	3.358	8.96	1.85	19.4	174.7	Clear	None
13:40	5	35	100	65.60	1.06	6.48	3.356	8.79	1.83	19.5	174.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250 mL Plastic	2	None

Comments: Breathing zone during sampling 0ppm

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-82			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.55	**Total Depth (ft-bmp)**	77.14	**Water Column (ft)**	10.59	**Gallons in Well**	1.72
Purge Start	10:25	**Pump Intake (ft-bmp)**	75.14	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:55	**Volumes Purged**	0.61	**Sample ID**	MW-16-82_102723	**Sampled by**	Donald Richmond
Sample Time	10:50	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:35	0	0	200	66.55	0.53	7.12	1.033	5.33	3.21	17.3	27.2	Clear	None
10:40	5	5	200	66.55	0.79	7.08	1.018	5.3	3.53	17.2	28.2	Clear	None
10:45	5	10	200	66.55	1.06	7.06	1.017	4.83	3.65	17.2	25.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-84			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.0 degrees F and Cloudy. The wind is blowing N/NW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.42	**Total Depth (ft-bmp)**	81.1	**Water Column (ft)**	11.68	**Gallons in Well**	1.90
Purge Start	09:30	**Pump Intake (ft-bmp)**	78.6	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:25	**Volumes Purged**	1.53	**Sample ID**	MW-16-84_102823	**Sampled by**	Austin Westhuis
Sample Time	10:15	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	200	70.78	0.26	7.12	2.339	85.8	8.46	13.3	86.2	Clear	None
09:40	5	5	200	71.24	0.53	7.06	2.36	508.3	5.02	13.6	78.1	Clear	None
09:45	5	10	200	71.95	0.79	7.07	2.289	165.17	4.96	13.9	73.7	Clear	None
09:50	5	15	200	72.18	1.06	7.08	2.264	133.76	5.06	13.9	75.9	Clear	None
09:55	5	20	200	72.39	1.32	7.07	2.285	111.93	4.88	13.9	83	Clear	None
10:00	5	25	200	72.50	1.59	7.06	2.312	108.37	4.64	13.9	90.4	Clear	None
10:05	5	30	200	72.52	1.85	7.05	2.333	102.26	4.51	14	93.3	Clear	None
10:10	5	35	200	72.53	2.11	7.05	2.339	99.62	4.48	14	93.7	Clear	None
10:15	5	40	200	72.57	2.38	7.05	2.342	97.71	4.44	14	94	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-16-85			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing N at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	70.91	**Total Depth (ft-bmp)**	81.79	**Water Column (ft)**	10.88	**Gallons in Well**	1.77
Purge Start	11:45	**Pump Intake (ft-bmp)**	79.29	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:20	**Volumes Purged**	1.04	**Sample ID**	MW-16-85_102823	**Sampled by**	Austin Westhuis
Sample Time	12:15	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	200	72.65	0.26	7.5	0.859	291.04	2.48	13.6	-96	Clear	None
11:55	5	5	200	72.94	0.53	7.53	0.819	232.76	2.19	14	-90.7	Clear	None
12:00	5	10	200	73.15	0.79	7.56	0.797	231.39	3.04	13.9	-83.3	Clear	None
12:05	5	15	200	74.15	1.06	7.62	0.785	204.38	4.53	13.7	-63.8	Clear	None
12:10	5	20	200	74.60	1.32	7.63	0.787	201.49	4.92	13.9	-57.7	Clear	None
12:15	5	25	200	74.95	1.59	7.65	0.788	195.34	4.99	13.9	-55.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Water level did not meet stabilization criteria.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-17-86			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.76	**Total Depth (ft-bmp)**	81.44	**Water Column (ft)**	14.68	**Gallons in Well**	2.39
Purge Start	08:55	**Pump Intake (ft-bmp)**	79.44	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**	1.22	**Sample ID**	MW-17-86_102723	**Sampled by**	Donald Richmond
Sample Time	09:55	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:10	0	0	200	66.76	0.79	7.07	1.741	2.47	2.51	15.8	246.7	Clear	None
09:15	5	5	200	66.76	1.06	7.01	1.759	2.2	1.4	15.7	248.6	Clear	None
09:20	5	10	200	66.76	1.32	6.93	1.811	2.23	0.37	15.7	248.5	Clear	None
09:25	5	15	200	66.76	1.59	6.9	1.895	4.32	0.15	15.7	115	Clear	None
09:30	5	20	200	66.76	1.85	6.91	1.928	4.12	0.09	15.7	42	Clear	None
09:35	5	25	200	66.76	2.11	6.92	1.952	3.06	0	15.8	-28.3	Clear	None
09:40	5	30	200	66.76	2.38	6.92	1.958	2.94	0	15.9	-39.6	Clear	None
09:45	5	35	200	66.76	2.64	6.92	1.959	2.68	0	15.8	-51.5	Clear	None
09:50	5	40	200	66.76	2.91	6.92	1.958	2.48	0	15.9	-59	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-17-87			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	77.12	**Total Depth (ft-bmp)**	113.78	**Water Column (ft)**	36.66	**Gallons in Well**	5.96
Purge Start	11:30	**Pump Intake (ft-bmp)**	111.78	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:40	**Volumes Purged**	0.53	**Sample ID**	MW-17-87_102523	**Sampled by**	Donald Richmond
Sample Time	12:35	**Gallons Purged**	3.1700646	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:40	0	0	200	77.12	0.53	8.23	1.758	10.62	1.82	15.3	100	Clear	None
11:45	5	5	200	77.12	0.79	7.85	1.787	12.16	0.09	15	-208.3	Clear	None
11:50	5	10	200	77.12	1.06	7.64	1.773	12.56	0.01	15	-210.6	Clear	None
11:55	5	15	200	77.12	1.32	7.54	1.771	16.53	0	15.1	-206.2	Clear	None
12:00	5	20	200	77.12	1.59	7.54	1.724	33	0	15.2	-206.9	Clear	None
12:05	5	25	200	77.12	1.85	8.86	1.648	36	0	15.5	-258.3	Clear	None
12:10	5	30	200	77.12	2.11	9.39	1.655	37	0	15.8	-226	Clear	None
12:15	5	35	200	77.12	2.38	9.47	1.677	34	0.01	16.2	-189	Clear	None
12:20	5	40	200	77.12	2.64	9.49	1.692	36	0.02	16.5	-165.7	Clear	None
12:25	5	45	200	77.12	2.91	9.52	1.707	28	0.03	16.6	-145	Clear	None
12:30	5	50	200	77.12	3.17	9.51	1.719	29	0.04	16.8	-126.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	2	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-100			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	57.0 degrees F and Clear. The wind is blowing SW at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.14	**Total Depth (ft-bmp)**	15.85	**Water Column (ft)**	5.71	**Gallons in Well**	0.93
Purge Start	14:50	**Pump Intake (ft-bmp)**	13.35	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:40	**Volumes Purged**	2.84	**Sample ID**	MW-18-100_110323	**Sampled by**	Austin Westhuis
Sample Time	15:35	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	200	10.70	0.26	7.85	0.915	102.33	5.7	16.6	-74.6	Clear	None
15:00	5	5	200	10.79	0.53	7.87	0.913	26.81	5.73	16.5	12.3	Clear	None
15:05	5	10	200	10.79	0.79	7.82	0.915	16.53	6.01	16.5	45.2	Clear	None
15:10	5	15	200	10.79	1.06	7.8	0.917	12.58	6.08	16.5	59.7	Clear	None
15:15	5	20	200	10.79	1.32	7.77	0.919	10.58	6.11	16.5	71.2	Clear	None
15:20	5	25	200	10.79	1.59	7.75	0.914	9.55	6.14	16.5	78.9	Clear	None
15:25	5	30	200	10.79	1.85	7.75	0.914	8.63	6.18	16.5	85.2	Clear	None
15:30	5	35	200	10.79	2.11	7.75	0.914	8.51	6.19	16.5	89.2	Clear	None
15:35	5	40	200	10.79	2.38	7.74	0.914	8.41	6.19	16.5	90.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-101			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.55	**Total Depth (ft-bmp)**	85	**Water Column (ft)**	21.45	**Gallons in Well**	3.49
Purge Start	11:10	**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:20	**Volumes Purged**	0.91	**Sample ID**	MW-18-101_110323	**Sampled by**	Donald Richmond
Sample Time	12:15	**Gallons Purged**	3.1700646	**Replicate/ Code No.**	DUP-09_110323	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:25	0	0	200	63.55	0.79	7.15	1.16	5.12	0.41	11.9	-91.1	Clear	Strong
11:30	5	5	200	63.55	1.06	7.13	1.153	4.89	0.29	11.9	-94.9	Clear	Strong
11:35	5	10	200	63.55	1.32	7.11	1.153	4.81	0.15	11.9	-99.6	Clear	Strong
11:40	5	15	200	63.55	1.59	7.1	1.151	4.73	0.1	11.9	-104.2	Clear	Strong
11:45	5	20	200	63.55	1.85	7.07	1.166	4.83	0	12.4	-119.1	Clear	Strong
11:50	5	25	200	63.55	2.11	7.07	1.17	4.8	0	12.4	-125.4	Clear	Strong
11:55	5	30	200	63.55	2.38	7.07	1.176	4.73	0	12.4	-133.3	Clear	Strong
12:00	5	35	200	63.55	2.64	7.06	1.184	4.74	0	12.5	-147.9	Clear	Strong
12:05	5	40	200	63.55	2.91	7.05	1.191	4.7	0	12.6	-160.5	Clear	Strong
12:10	5	45	200	63.55	3.17	7.05	1.202	4.8	0	12.8	-170.9	Clear	Strong

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-102			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.60	**Total Depth (ft-bmp)**	14.69	**Water Column (ft)**	2.09	**Gallons in Well**	0.34
Purge Start	09:30	**Pump Intake (ft-bmp)**	13.69	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:10	**Volumes Purged**	6.22	**Sample ID**	MW-18-102_110223	**Sampled by**	Austin Westhuis
Sample Time	10:05	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:35	0	0	200	12.84	0.26	7.24	0.637	90.37	1.94	12.3	185.8	Clear	None
09:40	5	5	200	12.84	0.53	7.25	0.636	49.89	1.26	12.7	182.5	Clear	None
09:45	5	10	200	12.84	0.79	7.26	0.636	36.42	0.99	12.7	178.4	Clear	None
09:50	5	15	200	12.84	1.06	7.26	0.635	33.84	0.81	12.8	174.7	Clear	None
09:55	5	20	200	12.84	1.32	7.27	0.636	32.78	0.65	12.8	167.7	Clear	None
10:00	5	25	200	12.84	1.59	7.28	0.633	31.79	0.63	12.8	163.2	Clear	None
10:05	5	30	200	12.84	1.85	7.28	0.633	31.21	0.61	12.8	161.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-103			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	37.0 degrees F and Cloudy. The wind is blowing S/SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.30	**Total Depth (ft-bmp)**	10.73	**Water Column (ft)**	8.43	**Gallons in Well**	1.37
Purge Start	10:25	**Pump Intake (ft-bmp)**	8.23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:15	**Volumes Purged**	1.93	**Sample ID**	MW-18-103_110223	**Sampled by**	Austin Westhuis
Sample Time	11:10	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:30	0	0	200	3.13	0.26	7.04	0.867	56.03	0.63	13	157.8	Clear	None
10:35	5	5	200	3.13	0.53	7.04	0.868	20.84	0.57	13	157.2	Clear	None
10:40	5	10	200	3.13	0.79	7.04	0.869	16.14	0.5	13.1	156.4	Clear	None
10:45	5	15	200	3.13	1.06	7.04	0.871	15.88	0.42	13.2	155	Clear	None
10:50	5	20	200	3.13	1.32	7.04	0.872	11.52	0.38	13.2	154	Clear	None
10:55	5	25	200	3.13	1.59	7.04	0.872	11.01	0.36	13.2	152.3	Clear	None
11:00	5	30	200	3.13	1.85	7.04	0.873	6.43	0.34	13.2	149.2	Clear	None
11:05	5	35	200	3.13	2.11	7.04	0.873	6.09	0.33	13.2	148.5	Clear	None
11:10	5	40	200	3.13	2.38	7.04	0.873	5.88	0.33	13.1	144.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-104			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.9 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.88	**Total Depth (ft-bmp)**	9.48	**Water Column (ft)**	6.60	**Gallons in Well**	1.07
Purge Start	11:30	**Pump Intake (ft-bmp)**	6.98	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:05	**Volumes Purged**	1.73	**Sample ID**	MW-18-104_110223	**Sampled by**	Austin Westhuis
Sample Time	12:00	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	200	3.78	0.26	7.3	0.576	9.98	6.62	14	173.1	Clear	None
11:40	5	5	200	3.78	0.53	7.3	0.575	7.54	6.71	13.9	175.6	Clear	None
11:45	5	10	200	3.78	0.79	7.3	0.574	7	7.04	14	180.3	Clear	None
11:50	5	15	200	3.78	1.06	7.3	0.574	6.33	7.21	13.9	183.3	Clear	None
11:55	5	20	200	3.78	1.32	7.29	0.573	5.71	7.25	13.9	186	Clear	None
12:00	5	25	200	3.78	1.59	7.3	0.572	5.6	7.36	14	188.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-105			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	43.0 degrees F and Cloudy. The wind is blowing S/SW at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.12	**Total Depth (ft-bmp)**	11.2	**Water Column (ft)**	10.08	**Gallons in Well**	1.64
Purge Start	12:50	**Pump Intake (ft-bmp)**	8.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:20	**Volumes Purged**	0.97	**Sample ID**	MW-18-105_110223	**Sampled by**	Austin Westhuis
Sample Time	13:15	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	200	1.55	0.26	7.21	0.625	11.41	1.44	12.9	190.1	Clear	None
13:00	5	5	200	1.95	0.53	7.21	0.616	7.05	2.54	12.9	188.6	Clear	None
13:05	5	10	200	1.95	0.79	7.21	0.617	6.6	2.58	12.6	188.5	Clear	None
13:10	5	15	200	1.95	1.06	7.21	0.616	6.64	2.58	12.6	188.3	Clear	None
13:15	5	20	200	1.95	1.32	7.21	0.614	6.23	2.7	12.7	188.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-88			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	52.0 degrees F and Clear. The wind is blowing S/SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.45	**Total Depth (ft-bmp)**	15.02	**Water Column (ft)**	10.57	**Gallons in Well**	1.72
Purge Start	12:10	**Pump Intake (ft-bmp)**	12.52	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:55	**Volumes Purged**	1.38	**Sample ID**	MW-18-88_110323	**Sampled by**	Austin Westhuis
Sample Time	12:50	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	200	4.62	0.26	7.49	0.777	45.55	0.76	16	-33	Clear	None
12:20	5	5	200	4.65	0.53	7.42	0.729	27.04	0.51	16	-8.3	Clear	None
12:25	5	10	200	4.65	0.79	7.35	0.722	18.24	0.37	16.1	9.2	Clear	None
12:30	5	15	200	4.65	1.06	7.32	0.72	13.72	0.33	16.1	15.6	Clear	None
12:35	5	20	200	4.65	1.32	7.3	0.716	10.2	0.27	16.1	20.5	Clear	None
12:40	5	25	200	4.65	1.59	7.29	0.713	8.77	0.25	16.1	24.2	Clear	None
12:45	5	30	200	4.65	1.85	7.28	0.712	8.03	0.24	16.2	26.8	Clear	None
12:50	5	35	200	4.65	2.11	7.28	0.711	7.79	0.24	16.2	28.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-89			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	43.0 degrees F and Mostly Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.91	**Total Depth (ft-bmp)**	15.6	**Water Column (ft)**	9.69	**Gallons in Well**	1.57
Purge Start	09:00	**Pump Intake (ft-bmp)**	13	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:35	**Volumes Purged**	0.59	**Sample ID**	MW-18-89_110423	**Sampled by**	Billy Cobern
Sample Time	09:35	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	DUP-07_110423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:05	0	0	100	6.69	0.13	7.61	0.843	11.13	1.05	15.1	119.7	Clear	None
09:10	5	5	100	7.25	0.26	7.61	0.854	6.64	0.72	14.6	119.8	Clear	None
09:15	5	10	100	7.80	0.40	7.61	0.853	7.24	0.46	14.6	114.8	Clear	None
09:20	5	15	100	8.50	0.53	7.59	0.855	6.57	0.34	14.8	107.6	Clear	None
09:25	5	20	100	9.21	0.66	7.58	0.855	6.57	0.37	14.8	101.6	Clear	None
09:30	5	25	100	9.89	0.79	7.58	0.855	6.61	0.36	14.9	100.7	Clear	None
09:35	5	30	100	10.54	0.92	7.58	0.856	6.45	0.36	14.9	99.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments: Didn't meet drawdown requirements.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-90			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing S/SW at 17.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.48	**Total Depth (ft-bmp)**	23.12	**Water Column (ft)**	13.64	**Gallons in Well**	2.22
Purge Start	13:50	**Pump Intake (ft-bmp)**	20.62	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:30	**Volumes Purged**	0.95	**Sample ID**	MW-18-90_110323	**Sampled by**	Austin Westhuis
Sample Time	14:25	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:55	0	0	200	9.48	0.26	11.95	1.828	23.46	0.48	16.3	-123.9	Clear	None
14:00	5	5	200	9.48	0.53	12.01	1.949	22.06	0.36	16.3	-137.6	Clear	None
14:05	5	10	200	9.48	0.79	12.05	2.006	21.94	0.3	16.2	-148.4	Clear	None
14:10	5	15	200	9.48	1.06	12.08	2.037	17.66	0.25	16.2	-158.5	Clear	None
14:15	5	20	200	9.48	1.32	12.11	2.075	11.35	0.2	16.3	-168.1	Clear	None
14:20	5	25	200	9.48	1.59	12.12	2.093	11.03	0.19	16.2	-171.9	Clear	None
14:25	5	30	200	9.48	1.85	12.13	2.107	10.83	0.19	16.1	-174.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-91			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.60	**Total Depth (ft-bmp)**	15.02	**Water Column (ft)**	9.42	**Gallons in Well**	1.53
Purge Start	11:05	**Pump Intake (ft-bmp)**	12.52	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:35	**Volumes Purged**	1.04	**Sample ID**	MW-18-91_110423	**Sampled by**	Austin Westhuis
Sample Time	11:30	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:10	0	0	200	6.89	0.26	7.93	0.651	23.69	0.83	14.1	-129	Clear	None
11:15	5	5	200	7.37	0.53	7.93	0.664	15.62	0.57	13.9	-114.5	Clear	None
11:20	5	10	200	7.73	0.79	7.91	0.662	15.05	0.44	13.7	-129.3	Clear	None
11:25	5	15	200	7.89	1.06	7.92	0.66	14.91	0.41	13.7	-128.3	Clear	None
11:30	5	20	200	7.95	1.32	7.92	0.658	14.45	0.4	13.7	-126.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-92			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	50.0 degrees F and Cloudy. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.55	**Total Depth (ft-bmp)**	30.1	**Water Column (ft)**	10.55	**Gallons in Well**	1.71
Purge Start	12:20	**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:45	**Volumes Purged**	0.39	**Sample ID**	MW-18-92_110423	**Sampled by**	Billy Cobern
Sample Time	12:45	**Gallons Purged**	0.6604301	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:25	0	0	100	20.48	0.13	6.63	1.196	9.82	0.56	13.3	132.4	Clear	None
12:30	5	5	100	20.88	0.26	6.61	1.189	9.05	0.38	13.4	115.6	Clear	None
12:35	5	10	100	21.18	0.40	6.59	1.186	8.67	0.34	13.4	107.8	Clear	None
12:40	5	15	100	21.39	0.53	6.58	1.185	8.34	0.36	13.4	101.9	Clear	None
12:45	5	20	100	21.39	0.66	6.56	1.184	8.05	0.35	13.4	98.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Didn't meet drawdown requirements.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-93			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	48.31	**Total Depth (ft-bmp)**	85.01	**Water Column (ft)**	36.70	**Gallons in Well**	5.96
Purge Start	14:40	**Pump Intake (ft-bmp)**	83.01	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:20	**Volumes Purged**	0.27	**Sample ID**	MW-18-93_110223	**Sampled by**	Donald Richmond
Sample Time	15:15	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	200	48.31	0.79	7.71	0.492	14	7.25	12.5	23.5	Clear	None
15:00	5	5	200	48.31	1.06	7.7	0.489	13.49	9.11	12.8	36.7	Clear	None
15:05	5	10	200	48.31	1.32	7.71	0.491	13.88	9.57	13.2	41.7	Clear	None
15:10	5	15	200	48.31	1.59	7.73	0.489	13	9.75	13	48.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-94			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	53.27	**Total Depth (ft-bmp)**	79.65	**Water Column (ft)**	26.38	**Gallons in Well**	4.29
Purge Start	09:15	**Pump Intake (ft-bmp)**	77.65	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**	0.43	**Sample ID**	MW-18-94_110323	**Sampled by**	Donald Richmond
Sample Time	09:55	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	200	53.27	0.79	7.45	3.475	4.96	2.89	10.6	-63.9	Clear	None
09:35	5	5	200	53.27	1.06	7.15	3.647	5.06	2.31	11	-103.4	Clear	None
09:40	5	10	200	53.27	1.32	7.1	3.768	4.13	2.24	11.2	-100.9	Clear	None
09:45	5	15	200	53.27	1.59	7.08	3.861	3.91	2.31	11.4	-97.9	Clear	None
09:50	5	20	200	53.27	1.85	7.07	3.892	3.78	2.42	11.3	-93.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-95			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	55.9 degrees F and Clear. The wind is blowing SW at 18.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.45	**Total Depth (ft-bmp)**	12.48	**Water Column (ft)**	6.03	**Gallons in Well**	0.98
Purge Start	16:00	**Pump Intake (ft-bmp)**	9.98	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:35	**Volumes Purged**	1.89	**Sample ID**	MW-18-95_110323	**Sampled by**	Austin Westhuis
Sample Time	16:30	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:05	0	0	200	6.75	0.26	7.4	0.611	91.43	2.04	14.5	110.4	Clear	None
16:10	5	5	200	6.75	0.53	7.4	0.608	48.65	1.59	14	103.4	Clear	None
16:15	5	10	200	6.75	0.79	7.4	0.605	45.28	1.49	13.9	101.3	Clear	None
16:20	5	15	200	6.75	1.06	7.41	0.6	44.5	1.29	13.7	99.5	Clear	None
16:25	5	20	200	6.75	1.32	7.41	0.595	43.31	1.27	13.6	97.9	Clear	None
16:30	5	25	200	6.75	1.59	7.41	0.593	41.91	1.25	13.5	97.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-97			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.55	**Total Depth (ft-bmp)**	85	**Water Column (ft)**	21.45	**Gallons in Well**	3.49
Purge Start	13:00	**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:30	**Volumes Purged**	0.53	**Sample ID**	MW-18-97_110323	**Sampled by**	Donald Richmond
Sample Time	13:25	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:10	0	0	200	63.55	0.53	6.92	1.51	4.32	0.3	13.8	-71.4	Clear	None
13:15	5	5	200	63.55	0.79	6.9	1.502	5.15	0.03	13.9	-78.8	Clear	None
13:20	5	10	200	63.55	1.06	6.89	1.502	4.88	0	14	-81.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-98			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Clear. The wind is blowing S/SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.39	**Total Depth (ft-bmp)**	14.9	**Water Column (ft)**	10.51	**Gallons in Well**	1.71
Purge Start	14:45	**Pump Intake (ft-bmp)**	12.7	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:15	**Volumes Purged**	0.93	**Sample ID**	MW-18-98_110223	**Sampled by**	Austin Westhuis
Sample Time	15:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	200	5.11	0.26	7.32	0.68	10.27	0.7	14.5	74.4	Clear	None
14:55	5	5	200	5.11	0.53	7.32	0.679	9.46	0.63	14.1	33.4	Clear	None
15:00	5	10	200	5.11	0.79	7.32	0.68	9.22	0.6	14.1	27	Clear	None
15:05	5	15	200	5.11	1.06	7.31	0.68	8.79	0.59	14.1	24.6	Clear	None
15:10	5	20	200	5.12	1.32	7.31	0.681	8.5	0.56	14.1	24.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-18-99			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	42.1 degrees F and Clear. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.99	**Total Depth (ft-bmp)**	16.93	**Water Column (ft)**	13.94	**Gallons in Well**	2.27
Purge Start	10:05	**Pump Intake (ft-bmp)**	14.43	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:50	**Volumes Purged**	1.05	**Sample ID**	MW-18-99_110323	**Sampled by**	Austin Westhuis
Sample Time	10:45	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	200	4.21	0.26	8.08	1.356	24.18	0.73	13.8	39.2	Clear	None
10:15	5	5	200	4.32	0.53	8.24	1.258	11.93	0.6	13.4	41.7	Clear	None
10:20	5	10	200	4.39	0.79	8.22	1.25	9.86	0.48	13.7	-27.1	Clear	None
10:25	5	15	200	4.41	1.06	8.22	1.241	9.66	0.44	13.4	-62.3	Clear	None
10:30	5	20	200	4.41	1.32	8.21	1.23	9.25	0.39	13.5	-105.5	Clear	None
10:35	5	25	200	4.42	1.59	8.19	1.212	8.48	0.34	14	-128.9	Clear	None
10:40	5	30	200	4.42	1.85	8.19	1.211	8.33	0.33	14.1	-130.3	Clear	None
10:45	5	35	200	4.42	2.11	8.18	1.201	7.51	0.31	14.1	-135.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-107			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	50.0 degrees F and Cloudy. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.80	**Total Depth (ft-bmp)**	29.85	**Water Column (ft)**	7.05	**Gallons in Well**	1.15
Purge Start	13:05	**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:35	**Volumes Purged**	0.69	**Sample ID**	MW-19-107_110423	**Sampled by**	Billy Cobern
Sample Time	13:35	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	MW-19-107_110423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:10	0	0	100	22.90	0.13	6.59	0.944	34.61	0.72	13.6	106.1	Clear	None
13:15	5	5	100	22.90	0.26	6.58	0.937	22.29	0.47	13.5	70.9	Clear	None
13:20	5	10	100	22.90	0.40	6.57	0.934	20.42	0.32	13.5	41.7	Clear	None
13:25	5	15	100	22.90	0.53	6.57	0.931	20.13	0.27	13.5	34.6	Clear	None
13:30	5	20	100	22.90	0.66	6.56	0.929	21.33	0.26	15.3	29.7	Clear	None
13:35	5	25	100	22.90	0.79	6.55	0.927	20.82	0.27	13.4	24.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	6	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-108			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.55	**Total Depth (ft-bmp)**	30.1	**Water Column (ft)**	10.55	**Gallons in Well**	1.71
Purge Start	11:00	**Pump Intake (ft-bmp)**	27.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:00	**Volumes Purged**	0.93	**Sample ID**	MW-19-108_110423	**Sampled by**	Billy Cobern
Sample Time	12:00	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:05	0	0	100	19.60	0.13	6.51	1.465	272.72	0.91	12.9	151.7	Clear	None
11:10	5	5	100	19.60	0.26	6.57	1.316	197.74	0.53	13	126.1	Clear	None
11:15	5	10	100	19.60	0.40	6.63	1.176	122.39	0.34	13.2	107.8	Clear	None
11:20	5	15	100	19.60	0.53	6.65	1.139	68.67	0.26	13.2	95.1	Clear	None
11:25	5	20	100	19.60	0.66	6.72	1.129	48.93	0.25	13.2	85.7	Clear	None
11:30	5	25	100	19.60	0.79	6.78	1.115	30.3	0.23	13.3	79.5	Clear	None
11:35	5	30	100	19.60	0.92	6.81	1.111	21.4	0.22	13.3	70.4	Clear	None
11:40	5	35	100	19.60	1.06	6.84	1.108	15.32	0.21	13.3	65.7	Clear	None
11:45	5	40	100	19.60	1.19	6.86	1.099	10.21	0.22	13.3	62.1	Clear	None
11:50	5	45	100	19.60	1.32	6.87	1.095	9.78	0.21	13.3	59.8	Clear	None
11:55	5	50	100	19.60	1.45	6.88	1.092	9.68	0.22	13.3	58.1	Clear	None
12:00	5	55	100	19.60	1.59	6.89	1.091	9.32	0.21	13.3	58.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Well Locked at Arrival: yes
Condition of Well: Good condition
Well Locked at Departure: yes
Well Completion: Stick-up
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-111			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	43.0 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.69	**Total Depth (ft-bmp)**	27.4	**Water Column (ft)**	2.71	**Gallons in Well**	0.44
Purge Start	10:00	**Pump Intake (ft-bmp)**	26.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:40	**Volumes Purged**	2.40	**Sample ID**	MW-19-111_110423	**Sampled by**	Billy Cobern
Sample Time	10:40	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	100	25.09	0.13	6.49	1.465	34.98	1.14	12.7	143.1	Clear	None
10:10	5	5	100	24.95	0.26	6.49	1.461	28.42	1.07	12.7	144.1	Clear	None
10:15	5	10	100	24.95	0.40	6.51	1.458	23.51	0.93	12.7	146.4	Clear	None
10:20	5	15	100	24.95	0.53	6.52	1.453	17.59	0.89	12.7	148.8	Clear	None
10:25	5	20	100	24.95	0.66	6.54	1.452	13.62	0.83	12.7	150.1	Clear	None
10:30	5	25	100	24.95	0.79	6.54	1.452	9.73	0.81	12.7	153.3	Clear	None
10:35	5	30	100	24.95	0.92	6.51	1.452	9.12	0.81	12.8	156.7	Clear	None
10:40	5	35	100	24.95	1.06	6.53	1.453	9.41	0.8	12.8	158.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-112			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	45.0 degrees F and Clear. The wind is blowing S/SW at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.40	**Total Depth (ft-bmp)**	17.58	**Water Column (ft)**	10.18	**Gallons in Well**	1.65
Purge Start	11:10	**Pump Intake (ft-bmp)**	15.08	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:50	**Volumes Purged**	1.28	**Sample ID**	MW-19-112_110323	**Sampled by**	Austin Westhuis
Sample Time	11:45	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:15	0	0	200	8.71	0.26	6.38	8.017	83.54	0.55	17.2	-80.3	Clear	None
11:20	5	5	200	9.16	0.53	6.41	8.026	79.95	0.27	16.9	-81.4	Clear	None
11:25	5	10	200	9.40	0.79	6.42	8.026	73.12	0.25	17	-80.9	Clear	None
11:30	5	15	200	9.49	1.06	6.43	8.023	70.94	0.22	17.2	-80.2	Clear	None
11:35	5	20	200	9.55	1.32	6.43	8.026	68.91	0.2	17.2	-78.4	Clear	None
11:40	5	25	200	9.56	1.59	6.44	8.014	67.37	0.19	17.2	-76.4	Clear	None
11:45	5	30	200	9.56	1.85	6.44	8.058	64.58	0.19	17.2	-73.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-114			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	45.0 degrees F and Cloudy. The wind is blowing S at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.18	**Total Depth (ft-bmp)**	10.78	**Water Column (ft)**	8.60	**Gallons in Well**	1.40
Purge Start	13:45	**Pump Intake (ft-bmp)**	8.28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:20	**Volumes Purged**	1.32	**Sample ID**	MW-19-114_110223	**Sampled by**	Austin Westhuis
Sample Time	14:15	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	200	2.24	0.26	7.42	0.481	4.92	0.83	14.1	102.9	Clear	None
13:55	5	5	200	2.24	0.53	7.42	0.48	4.02	0.67	14.1	105	Clear	None
14:00	5	10	200	2.24	0.79	7.42	0.481	3.57	0.47	14.1	103.9	Clear	None
14:05	5	15	200	2.24	1.06	7.41	0.481	3.62	0.4	14.1	101.1	Clear	None
14:10	5	20	200	2.24	1.32	7.41	0.481	3.51	0.38	14.1	99.5	Clear	None
14:15	5	25	200	2.24	1.59	7.41	0.481	3.29	0.37	14.1	98	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-115			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.81	**Total Depth (ft-bmp)**	80.69	**Water Column (ft)**	21.88	**Gallons in Well**	3.56
Purge Start	14:15	**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:05	**Volumes Purged**	0.59	**Sample ID**	MW-19-115_102723	**Sampled by**	Donald Richmond
Sample Time	15:00	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:40	0	0	200	58.81	1.32	7.45	2.386	15.47	5.16	21.4	202.4	Clear	None
14:45	5	5	200	58.81	1.59	7.45	2.392	11.67	5.15	21.4	205	Clear	None
14:50	5	10	200	58.81	1.85	7.44	2.273	10.96	5.08	19.6	210.5	Clear	None
14:55	5	15	200	58.81	2.11	7.43	2.422	9.54	5.08	21.9	212	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-116			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.71	**Total Depth (ft-bmp)**	73.19	**Water Column (ft)**	16.48	**Gallons in Well**	2.68
Purge Start	12:55	**Pump Intake (ft-bmp)**	71.19	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:55	**Volumes Purged**	0.99	**Sample ID**	MW-19-116_102723	**Sampled by**	Donald Richmond
Sample Time	13:50	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:10	0	0	200	56.71	0.79	6.581	1.131	13	0.88	18.9	205.7	Clear	None
13:15	5	5	200	56.71	1.06	6.52	1.152	12.4	1.2	19.3	208.2	Clear	None
13:20	5	10	200	56.71	1.32	6.57	1.16	12.61	2.79	19.4	227	Clear	None
13:25	5	15	200	56.71	1.59	6.61	1.162	12.26	3.55	19.5	237.5	Clear	None
13:30	5	20	200	56.71	1.85	6.64	1.17	11.74	4.22	19.7	245	Clear	None
13:35	5	25	200	56.71	2.11	6.69	1.187	11.31	5.27	20.1	254.5	Clear	None
13:40	5	30	200	56.71	2.38	6.73	1.182	10.65	5.57	19.9	255.2	Clear	None
13:45	5	35	200	56.71	2.64	6.75	1.181	10	5.64	19.8	252.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-117			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.57	**Total Depth (ft-bmp)**	62.85	**Water Column (ft)**	3.28	**Gallons in Well**	0.53
Purge Start	12:00	**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:40	**Volumes Purged**	2.99	**Sample ID**	MW-19-117_102723	**Sampled by**	Donald Richmond
Sample Time	12:35	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	200	59.57	0.79	6.97	0.986	972	2.76	19.1	-4.5	Grayish Brown	None
12:20	5	5	200	59.57	1.06	6.92	0.988	681	1.02	19.6	-62.8	Grayish Brown	None
12:25	5	10	200	59.57	1.32	6.92	0.987	695	1	19.6	-64.3	Grayish Brown	None
12:30	5	15	200	59.57	1.59	6.91	0.984	693	0.94	19.5	-65.7	Grayish Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-118D			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	63.0 degrees F and Cloudy. The wind is blowing S/SW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	78.53	**Total Depth (ft-bmp)**	193	**Water Column (ft)**	114.47	**Gallons in Well**	18.60
Purge Start	10:35	**Pump Intake (ft-bmp)**	185.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:10	**Volumes Purged**	0.05	**Sample ID**	MW-19-118D_102523	**Sampled by**	Billy Cobern
Sample Time	11:10	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	78.55	0.13	7.32	1.736	5.93	8.85	16.9	139.9	Clear	None
10:45	5	5	100	78.55	0.26	7.29	1.74	5.59	8.86	16.9	146.1	Clear	None
10:50	5	10	100	78.55	0.40	7.28	1.741	6.22	8.87	16.8	148.7	Clear	None
10:55	5	15	100	78.55	0.53	7.27	1.743	4.48	8.77	16.8	152.1	Clear	None
11:00	5	20	100	78.55	0.66	7.24	1.742	5.07	8.21	16.7	159	Clear	None
11:05	5	25	100	78.55	0.79	7.23	1.741	5.62	8	16.7	161.6	Clear	None
11:10	5	30	100	78.55	0.92	7.23	1.741	5.43	8.12	16.8	163.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments: Shares outer casing with MW-19-118S.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-118S			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	63.0 degrees F and Cloudy. The wind is blowing SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	78.53	**Total Depth (ft-bmp)**	162.9	**Water Column (ft)**	84.37	**Gallons in Well**	13.71
Purge Start	11:45	**Pump Intake (ft-bmp)**	155.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:35	**Volumes Purged**	0.10	**Sample ID**	MW-19-118S_102523	**Sampled by**	Billy Cobern
Sample Time	12:35	**Gallons Purged**	1.32086	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	100	78.55	0.13	7.12	2.48	4.61	4.81	16.9	-82.6	Clear	None
11:55	5	5	100	78.55	0.26	7.09	2.48	5.15	5.48	17.3	-69.4	Clear	None
12:00	5	10	100	78.55	0.40	6.99	2.576	24.43	5.28	17.3	-61.3	Clear	None
12:05	5	15	100	78.55	0.53	6.76	2.894	28.71	3.06	17.4	-73.1	Clear	None
12:10	5	20	100	78.55	0.66	6.75	2.911	82.3	1.95	17.6	-79.4	Clear	None
12:15	5	25	100	78.55	0.79	6.74	1.995	6.28	2.02	18.2	-85.4	Clear	None
12:20	5	30	100	78.55	0.92	6.73	3.05	3.76	1.18	18.3	-87.1	Clear	None
12:25	5	35	100	78.55	1.06	6.72	3.06	5.6	0.81	18.3	-89.5	Clear	None
12:30	5	40	100	78.55	1.19	6.71	3.061	5.38	0.79	18.2	-93.4	Clear	None
12:35	5	45	100	78.55	1.32	6.71	3.076	5.71	0.77	18.1	-92.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments: Shares outer casing with MW-19-118D

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-119D			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	28.9 degrees F and Mostly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	84.89	**Total Depth (ft-bmp)**	197.9	**Water Column (ft)**	113.01	**Gallons in Well**	18.36
Purge Start	09:15	**Pump Intake (ft-bmp)**	195	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:15	**Volumes Purged**	0.09	**Sample ID**	MW-19-119D_110123	**Sampled by**	Billy Cobern
Sample Time	10:15	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:20	0	0	100	84.89	0.13	7.21	1.262	45.2	2.67	11.7	8.2	Clear	None
09:25	5	5	100	84.90	0.26	7.16	1.258	38.92	1.66	11.6	-5.6	Clear	None
09:30	5	10	100	84.90	0.40	7.12	1.256	32.41	1.2	11.6	-15	Clear	None
09:35	5	15	100	84.90	0.53	7.11	1.254	26.94	0.96	11.6	-21.1	Clear	None
09:40	5	20	100	84.90	0.66	7.08	1.255	23.82	0.66	11.4	-33.5	Clear	None
09:45	5	25	100	84.90	0.79	7.08	1.252	19.89	0.61	11.3	-36.4	Clear	None
09:50	5	30	100	84.90	0.92	7.07	1.249	15.94	0.58	11.1	-39.7	Clear	None
09:55	5	35	100	84.90	1.06	7.07	1.245	13.21	0.53	11.1	-43.3	Clear	None
10:00	5	40	100	84.90	1.19	7.06	1.243	10.94	0.52	11.1	-45.1	Clear	None
10:05	5	45	100	84.90	1.32	7.06	1.246	9.93	0.51	11	-46.7	Clear	None
10:10	5	50	100	84.90	1.45	7.06	1.245	9.73	0.49	10.9	-48.2	Clear	None
10:15	5	55	100	84.90	1.59	7.06	1.245	9.52	0.49	10.9	-49.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	2	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-119S			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	28.9 degrees F and Mostly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	71.52	**Total Depth (ft-bmp)**	163.9	**Water Column (ft)**	92.38	**Gallons in Well**	15.01
Purge Start	10:40	**Pump Intake (ft-bmp)**	161.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:15	**Volumes Purged**	0.06	**Sample ID**	MW-19-119S_110123	**Sampled by**	Billy Cobern
Sample Time	11:15	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	100	71.74	0.13	7.53	0.585	4.13	7.58	7.1	-18.7	Clear	None
10:50	5	5	100	71.79	0.26	7.1	1.214	3.85	1.44	6.4	-36.7	Clear	None
10:55	5	10	100	71.81	0.40	7.05	1.212	8.24	2.73	8	-43.2	Clear	None
11:00	5	15	100	71.81	0.53	7.05	1.252	9.54	2.36	8.3	-35.8	Clear	None
11:05	5	20	100	71.81	0.66	7.06	1.273	9.78	1.92	7.8	-28.2	Clear	None
11:10	5	25	100	71.81	0.79	7.06	1.273	9.02	1.87	7.7	-27	Clear	None
11:15	5	30	100	71.81	0.92	7.06	1.273	9.36	1.89	7.7	-25.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	2	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-120			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.0 degrees F and Cloudy. The wind is blowing W/NW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.65	**Total Depth (ft-bmp)**	73.95	**Water Column (ft)**	7.30	**Gallons in Well**	1.19
Purge Start	08:10	**Pump Intake (ft-bmp)**	71.45	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:00	**Volumes Purged**	2.22	**Sample ID**	MW-19-120_102823	**Sampled by**	Austin Westhuis
Sample Time	08:55	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:15	0	0	200	66.65	0.26	7.2	2.563	291.1	2.9	14.2	45	Clear	None
08:20	5	5	200	66.65	0.53	7.2	2.519	179.12	3	14.2	49.5	Clear	None
08:25	5	10	200	66.65	0.79	7.21	2.45	131.12	3.38	14.2	45	Clear	None
08:30	5	15	200	66.65	1.06	7.21	2.461	90.25	3.28	14.3	41.5	Clear	None
08:35	5	20	200	66.65	1.32	7.2	2.508	68.71	3	14.3	34.9	Clear	None
08:40	5	25	200	66.65	1.59	7.2	2.516	53.28	2.96	14.3	33.2	Clear	None
08:45	5	30	200	66.65	1.85	7.19	2.54	45.19	2.86	14.3	28.6	Clear	None
08:50	5	35	200	66.65	2.11	7.19	2.539	43.68	2.84	14.4	24.9	Clear	None
08:55	5	40	200	66.65	2.38	7.2	2.524	41.94	2.96	14.4	22.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-121			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.48	**Total Depth (ft-bmp)**	73.6	**Water Column (ft)**	5.12	**Gallons in Well**	0.83
Purge Start	11:25	**Pump Intake (ft-bmp)**	71.6	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:20	**Volumes Purged**	2.55	**Sample ID**	MW-19-121_102623	**Sampled by**	Donald Richmond
Sample Time	12:10	**Gallons Purged**	2.113376	**Replicate/ Code No.**	DUP-05_102623	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:40	0	0	200	68.48	0.79	7.49	1.913	91	9.1	16.6	251.5	Clear	None
11:45	5	5	200	68.48	1.06	7.26	1.877	20	9.34	16.7	259.7	Clear	None
11:50	5	10	200	68.48	1.32	7.22	1.862	17	10.25	16.6	267.4	Clear	None
11:55	5	15	200	68.48	1.59	7.22	1.859	10	10.49	16.7	273.4	Clear	None
12:00	5	20	200	68.48	1.85	7.23	1.867	10.31	10.48	16.9	276	Clear	None
12:05	5	25	200	68.48	2.11	7.24	1.879	9.91	10.44	17.1	278.9	Clear	None

Constituent Sampled	Container	Number	Preservative
T. Phosphorus/TKN	250 mL Plastic	2	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL
Nitrate/Nitrite	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-122			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	37.9 degrees F and Mostly Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.20	**Total Depth (ft-bmp)**	66.8	**Water Column (ft)**	2.60	**Gallons in Well**	0.42
Purge Start	11:30	**Pump Intake (ft-bmp)**	66.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:30	**Volumes Purged**	3.77	**Sample ID**	MW-19-122_103023	**Sampled by**	Billy Cobern
Sample Time	12:30	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	100	64.20	0.13	6.48	5.118	2255.36	3.97	12.2	120.5	Clear	None
11:40	5	5	100	64.20	0.26	6.51	5.283	826.58	4.19	12.7	122	Clear	None
11:45	5	10	100	64.20	0.40	6.44	5.269	455.27	2.01	12.7	121.1	Clear	None
11:50	5	15	100	64.20	0.53	6.44	5.292	166.67	1.71	12.1	118.2	Clear	None
11:55	5	20	100	64.20	0.66	6.43	5.251	75.63	1.85	12.2	113.5	Clear	None
12:00	5	25	100	64.20	0.79	6.44	5.187	55.04	2.32	12.5	110.4	Clear	None
12:05	5	30	100	64.20	0.92	6.44	5.119	38.33	2.72	12.7	109.4	Clear	None
12:10	5	35	100	64.20	1.06	6.44	5.058	23.56	3.02	12.3	110.5	Clear	None
12:15	5	40	100	64.20	1.19	6.44	4.989	39.03	3.11	12.5	112	Clear	None
12:20	5	45	100	64.20	1.32	6.46	4.979	35.74	3.63	12.9	114	Clear	None
12:25	5	50	100	64.20	1.45	6.47	4.962	27.42	2.21	12.9	-117.3	Clear	None
12:30	5	55	100	64.20	1.59	6.49	5.005	34.21	3.05	12.9	-119.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm. Well is bubbling. Didn't meet stabilization criteria.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-123			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	70.02	**Total Depth (ft-bmp)**	73.8	**Water Column (ft)**	3.78	**Gallons in Well**	0.61
Purge Start	13:10	**Pump Intake (ft-bmp)**	71.8	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:15	**Volumes Purged**	4.33	**Sample ID**	MW-19-123_102623	**Sampled by**	Donald Richmond
Sample Time	02:05	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	200	70.02	0.53	6.7	1.992	122.3	5.55	16.6	252	Clear	None
13:25	5	5	200	70.02	0.79	6.66	1.938	100	5	16.1	269.8	Clear	None
13:30	5	10	200	70.02	1.06	6.66	1.933	79	4.83	16.1	275.4	Clear	None
13:35	5	15	200	70.02	1.32	6.65	1.93	41	4.73	16.1	281.4	Clear	None
13:40	5	20	200	70.02	1.59	6.65	1.929	34	4.68	16.3	284.8	Clear	None
13:45	5	25	200	70.02	1.85	6.65	1.919	28	4.55	16.2	288.1	Clear	None
13:50	5	30	200	70.02	2.11	6.64	1.936	20	4.41	16.3	291.4	Clear	None
13:55	5	35	200	70.02	2.38	6.64	1.936	20	4.26	16.3	293.2	Clear	None
14:00	5	40	200	70.02	2.64	6.64	1.947	19	4.1	16.5	294.9	Clear	None

Constituent Sampled	Container	Number	Preservative
T. Phosphorus/TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
Nitrate/Nitrite	250 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-124			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing NW at 13.9 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.13	**Total Depth (ft-bmp)**	72.25	**Water Column (ft)**	7.12	**Gallons in Well**	1.16
Purge Start	13:10	**Pump Intake (ft-bmp)**	70	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:10	**Volumes Purged**	1.37	**Sample ID**	MW-19-124_103023	**Sampled by**	Billy Cobern
Sample Time	14:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	100	65.15	0.13	6.83	3.432	1092.31	6.44	10.5	-2.1	Brown	None
13:20	5	5	100	65.15	0.26	6.56	3.376	1019.31	1.51	11.4	-37.4	Brown	None
13:25	5	10	100	65.15	0.40	6.54	3.369	969.38	0.97	11.2	-40.6	Brown	None
13:30	5	15	100	65.15	0.53	6.52	3.336	817.37	0.55	11.3	-43.6	Brown	None
13:35	5	20	100	65.15	0.66	6.5	3.312	640.66	0.66	11.4	-45	Brown	None
13:40	5	25	100	65.15	0.79	6.49	3.301	377.94	0.77	11.7	-46.4	Brown	None
13:45	5	30	100	65.15	0.92	6.49	3.281	215.83	0.75	11.8	-47.4	Brown	None
13:50	5	35	100	65.15	1.06	6.49	3.278	160.92	0.77	11.8	-48.3	Brown	None
13:55	5	40	100	65.15	1.19	6.48	3.279	135.32	0.76	12	-49	Brown	None
14:00	5	45	100	65.15	1.32	6.48	3.273	115.73	0.74	11.9	-49.9	Brown	None
14:05	5	50	100	65.15	1.45	6.48	3.265	83.49	0.67	12	-51.7	Brown	None
14:10	5	55	100	65.15	1.59	6.47	3.262	72.67	0.62	12.2	-53.4	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm. Didn't meet stabilization criteria.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-19-125			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing S/SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	78.48	**Total Depth (ft-bmp)**	102.5	**Water Column (ft)**	24.02	**Gallons in Well**	3.90
Purge Start	13:10	**Pump Intake (ft-bmp)**	100	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:50	**Volumes Purged**	0.27	**Sample ID**	MW-19-125_102523	**Sampled by**	Billy Cobern
Sample Time	13:50	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	100	79.00	0.13	10.38	0.694	26.75	0.39	14.8	-2.6	Clear	None
13:20	5	5	100	79.25	0.26	10.39	0.693	31.58	0.42	15	-16.1	Clear	None
13:25	5	10	100	79.51	0.40	10.42	0.694	29.89	0.42	15	-21.2	Clear	None
13:30	5	15	100	79.77	0.53	10.4	0.693	28.4	0.5	15.3	-29.5	Clear	None
13:35	5	20	100	80.05	0.02	10.41	0.694	28.76	0.54	15.4	29.79	Clear	None
13:40	5	25	100	80.31	0.79	10.42	0.696	29.1	0.66	15.4	-32.6	Clear	None
13:45	5	30	100	80.57	0.92	10.41	0.697	29.05	0.67	15.4	-32.9	Clear	None
13:50	5	35	100	80.83	1.06	10.41	0.697	29.08	0.66	15.4	-33.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 522	250 mL Amber	1	HCL

Comments: The screened area has collapsed. Spread sheet states that the well is screened from 100-115 below grade. The total depth from grade is now 100'. In June of 2022 I measured the total depth at 104.75 which would have been 102.25 from grade. Today I measured the total depth at 102.5, which is 100' from grade.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well:
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-126			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing W at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.80	**Total Depth (ft-bmp)**	75.5	**Water Column (ft)**	14.70	**Gallons in Well**	2.39
Purge Start	16:15	**Pump Intake (ft-bmp)**	73	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	17:00	**Volumes Purged**	0.50	**Sample ID**	MW-20-126_103023	**Sampled by**	Billy Cobern
Sample Time	17:00	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:20	0	0	100	61.10	0.13	6.75	3.966	289.64	4.38	12.4	87	Gray	None
16:25	5	5	100	61.10	0.26	6.72	3.966	150.09	3.29	12.5	95.4	Gray	None
16:30	5	10	100	61.10	0.40	6.72	3.954	83.94	2.84	12.3	100.5	Gray	None
16:35	5	15	100	61.10	0.53	6.71	3.946	70.93	2.65	12.2	102.4	Gray	None
16:40	5	20	100	61.10	0.66	6.71	3.944	51.22	2.64	12.4	103.3	Gray	None
16:45	5	25	100	61.10	0.79	6.7	3.941	46.29	2.39	12.3	104.6	Gray	None
16:50	5	30	100	61.10	0.92	6.7	3.933	37.94	2.28	12.1	105.4	Gray	None
16:55	5	35	100	61.10	1.06	6.7	3.928	38.63	2.22	12.1	105.7	Gray	None
17:00	5	40	100	61.10	1.19	6.7	3.921	36.97	2.36	12.2	105.5	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Well under pressure. Water bubbling in well. Breathing zone during sampling 0ppm. Could not accurately measure DTW.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-127			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.45	**Total Depth (ft-bmp)**	78.65	**Water Column (ft)**	13.20	**Gallons in Well**	2.14
Purge Start	16:00	**Pump Intake (ft-bmp)**	76.65	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	17:00	**Volumes Purged**	1.23	**Sample ID**	MW-20-127_102623	**Sampled by**	Donald Richmond
Sample Time	16:55	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:10	0	0	200	65.45	0.53	6.56	2.69	8.66	0.37	16.3	139.4	Clear	None
16:15	5	5	200	65.45	0.79	6.56	2.676	12	0.23	16.2	114.2	Clear	None
16:20	5	10	200	65.45	1.06	6.56	2.678	15.35	0.11	16.2	75.4	Clear	None
16:25	5	15	200	65.45	1.32	6.56	2.682	18.32	0.05	16.3	54	Clear	None
16:30	5	20	200	65.45	1.59	6.56	2.682	19.64	0.04	16.3	50.7	Clear	None
16:35	5	25	200	65.45	1.85	6.56	2.687	23	0.02	16.3	40.3	Clear	None
16:40	5	30	200	65.45	2.11	6.57	2.659	35	0	16.1	27.8	Clear	None
16:45	5	35	200	65.45	2.38	6.57	2.661	40	0	16.3	21.8	Clear	None
16:50	5	40	200	65.45	2.64	6.58	2.663	50	0	16.1	18	Clear	None

Constituent Sampled	Container	Number	Preservative
T. Phosphorus/TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
Nitrate/Nitrite	250 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-128			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.15	**Total Depth (ft-bmp)**	70.19	**Water Column (ft)**	7.04	**Gallons in Well**	1.14
Purge Start	14:40	**Pump Intake (ft-bmp)**	68.19	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:25	**Volumes Purged**	1.85	**Sample ID**	MW-20-128_102623	**Sampled by**	Donald Richmond
Sample Time	15:25	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:50	0	0	200	63.15	0.53	7.52	2.9	1000	9.74	18.2	260.7	Brown	None
14:55	5	5	200	63.15	0.79	7.51	2.906	928	9.55	18.2	264.1	Brown	None
15:00	5	10	200	63.15	1.06	7.52	2.91	928	9.42	18.2	267.7	Brown	None
15:05	5	15	200	63.15	1.32	7.5	2.909	1700	10.03	18.2	273.3	Brown	None
15:10	5	20	200	63.15	1.59	7.61	2.904	2995	11.25	18.2	276.4	Brown	None
15:15	5	25	200	63.15	1.85	7.67	2.907	2972	11.63	18.1	277.7	Brown	None
15:20	5	30	200	63.15	2.11	7.7	2.913	2822	11.62	18.1	279	Brown	None

Constituent Sampled	Container	Number	Preservative
T. Phosphorus/TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
Nitrate/Nitrite	250 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-129			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.03	**Total Depth (ft-bmp)**	71	**Water Column (ft)**	9.97	**Gallons in Well**	1.62
Purge Start	10:10	**Pump Intake (ft-bmp)**	68.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:55	**Volumes Purged**	0.73	**Sample ID**	MW-20-129_103023	**Sampled by**	Billy Cobern
Sample Time	10:55	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:15	0	0	100	61.55	0.13	6.74	2.084	249.36	2.59	12.4	-22.2	Clear	None
10:20	5	5	100	62.35	0.26	6.77	2.063	94.85	0.59	12.3	-39.5	Clear	None
10:25	5	10	100	62.95	0.40	6.77	2.023	82.48	0.51	11.2	-43.3	Clear	None
10:30	5	15	100	63.44	0.53	6.76	2.001	64.87	0.48	11.4	-46.5	Clear	None
10:35	5	20	100	63.68	0.66	6.76	1.986	53.73	0.44	11	-48.6	Clear	None
10:40	5	25	100	63.88	0.79	6.75	1.989	47.07	0.42	11.2	-49.9	Clear	None
10:45	5	30	100	64.07	0.92	6.75	1.994	42.2	0.39	11.1	-50.2	Clear	None
10:50	5	35	100	64.25	1.06	6.75	1.993	41.43	0.38	11.1	-52.1	Clear	None
10:55	5	40	100	64.41	1.19	6.75	1.995	40.99	0.38	11.1	-54.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm. Drawdown didn't stabilize.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-130			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	66.0 degrees F and Cloudy. The wind is blowing SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.70	**Total Depth (ft-bmp)**	70.3	**Water Column (ft)**	2.60	**Gallons in Well**	0.42
Purge Start	11:30	**Pump Intake (ft-bmp)**	69.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:25	**Volumes Purged**	3.46	**Sample ID**	MW-20-130_102723	**Sampled by**	Billy Cobern
Sample Time	12:25	**Gallons Purged**	1.452946	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	100	67.75	0.13	6.63	1.858	1271	5.92	17.9	55.4	Orange	None
11:40	5	5	100	67.75	0.26	6.55	1.753	844	3.37	17.3	34.5	Orange	None
11:45	5	10	100	67.75	0.40	6.48	1.689	210	0.91	16.5	25.1	Orange	None
11:50	5	15	100	67.75	0.53	6.48	1.697	201	0.89	16.4	25.7	Orange	None
11:55	5	20	100	67.75	0.66	6.48	1.695	173.35	0.9	16.4	26	Orange	None
12:00	5	25	100	67.75	0.79	6.48	1.694	189.53	0.9	16.4	26.5	Orange	None
12:05	5	30	100	67.75	0.92	6.47	1.69	84.71	1.03	16.4	38.2	Orange	None
12:10	5	35	100	67.75	1.06	6.47	1.684	61.91	0.92	16.4	30.7	Orange	None
12:15	5	40	100	67.75	1.19	6.46	1.68	47.31	1.02	16.3	33.1	Orange	None
12:20	5	45	100	67.75	1.32	6.46	1.68	46.58	1.03	16.2	37.7	Orange	None
12:25	5	50	100	67.75	1.45	6.46	1.681	45.93	1.04	16.2	38.4	Orange	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments: Iron in well. Drained and cleaned the flow cell at 11:40&12:00.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-131			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.20	**Total Depth (ft-bmp)**	8.64	**Water Column (ft)**	3.44	**Gallons in Well**	0.56
Purge Start	10:35	**Pump Intake (ft-bmp)**	7.0	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:35	**Volumes Purged**	4.72	**Sample ID**	MW-20-131_103123	**Sampled by**	Donald Richmond
Sample Time	11:30	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	200	5.20	0.53	7.11	3.241	293	0.8	11	62.8	Clear	None
10:50	5	5	200	5.20	0.79	7.09	3.647	34	0.16	14.2	55.9	Clear	None
10:55	5	10	200	5.20	1.06	7.1	3.767	31	0	14.7	48.1	Clear	None
11:05	10	20	200	5.20	1.59	7.11	3.789	31	0	15	30.8	Clear	None
11:10	5	25	200	5.20	1.85	7.12	3.788	11	0	15.1	22.1	Clear	None
11:15	5	30	200	5.20	2.11	7.12	3.798	10.12	0	15.3	15	Clear	None
11:20	5	35	200	5.20	2.38	7.13	3.808	6.91	0	15.5	11.4	Clear	None
11:25	5	40	200	5.20	2.64	7.13	3.785	7.27	0	15.3	5.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-20-132			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.12	**Total Depth (ft-bmp)**	10.82	**Water Column (ft)**	5.70	**Gallons in Well**	0.93
Purge Start	13:10	**Pump Intake (ft-bmp)**	9.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:05	**Volumes Purged**	2.56	**Sample ID**	MW-20-132_103123	**Sampled by**	Donald Richmond
Sample Time	14:00	**Gallons Purged**	2.377548	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:20	0	0	200	5.12	0.53	7.23	4.357	322	1.88	14.8	-160.9	Clear	None
13:25	5	5	200	5.12	0.79	7.11	4.078	65	0.09	14.6	-121.2	Clear	None
13:30	5	10	200	5.12	1.06	7.1	4.037	41	0	15.1	-100.7	Clear	None
13:35	5	15	200	5.12	1.32	7.1	3.989	25	0	15	-91.5	Clear	None
13:40	5	20	200	5.12	1.59	7.1	3.995	18.79	0	15.1	-92.5	Clear	None
13:45	5	25	200	5.12	1.85	7.1	3.993	13	0	15.2	-92	Clear	None
13:50	5	30	200	5.12	2.11	7.1	3.941	13.61	0	15	-90.1	Clear	None
13:55	5	35	200	5.12	2.38	7.1	3.919	8	0	15	-87.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-133			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	28.9 degrees F and sunny.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.43	**Total Depth (ft-bmp)**	18.74	**Water Column (ft)**	8.31	**Gallons in Well**	1.35
Purge Start	11:45	**Pump Intake (ft-bmp)**	16.24	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:15	**Volumes Purged**	1.17	**Sample ID**	MW-21-133_110123	**Sampled by**	Austin Westhuis
Sample Time	12:10	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	200	12.28	0.26	7.09	0.895	5.11	0.74	12.5	161.7	Clear	None
11:55	5	5	200	12.31	0.53	7.09	0.894	4.01	0.68	12.7	158.7	Clear	None
12:00	5	10	200	12.31	0.79	7.09	0.901	3.7	0.73	12.6	157.3	Clear	None
12:05	5	15	200	12.31	1.06	7.11	0.901	3.56	0.73	12.4	156.9	Clear	None
12:10	5	20	200	12.31	1.32	7.1	0.903	3.47	0.74	12.4	155.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-134			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	37.0 degrees F and Clear.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.05	**Total Depth (ft-bmp)**	20.08	**Water Column (ft)**	6.03	**Gallons in Well**	0.98
Purge Start	12:30	**Pump Intake (ft-bmp)**	17.58	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:00	**Volumes Purged**	1.62	**Sample ID**	MW-21-134_110123	**Sampled by**	Austin Westhuis
Sample Time	12:55	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:35	0	0	200	14.63	0.26	7.19	0.805	18.4	1.41	11.8	160.4	Clear	None
12:40	5	5	200	14.63	0.53	7.21	0.799	11.56	1.25	11.6	155	Clear	None
12:45	5	10	200	14.63	0.79	7.19	0.797	3.81	1.21	11.6	155.4	Clear	None
12:50	5	15	200	14.63	1.06	7.18	0.801	3.45	1.17	11.5	156.5	Clear	None
12:55	5	20	200	14.63	1.32	7.18	0.811	3.39	1.16	11.5	157.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-135			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Partly Cloudy.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	26.15	**Total Depth (ft-bmp)**	29.55	**Water Column (ft)**	3.40	**Gallons in Well**	0.55
Purge Start	13:45	**Pump Intake (ft-bmp)**	28.55	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:25	**Volumes Purged**	4.32	**Sample ID**	MW-21-135_110123	**Sampled by**	Austin Westhuis
Sample Time	14:15	**Gallons Purged**	2.377548	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	200	28.40	0.26	7.29	0.833	168.54	1	11.7	-82.9	Clear	None
13:55	5	5	200	28.40	0.53	7.27	0.84	113.87	1.14	10.9	-79.9	Clear	None
14:00	5	10	200	28.40	0.79	7.27	0.841	74.61	1.1	11	-78.7	Clear	None
14:05	5	15	200	28.40	1.06	7.26	0.842	60.84	0.97	11.2	-79.9	Clear	None
14:10	5	20	200	28.40	1.32	7.25	0.844	56.67	0.95	11.2	-80.3	Clear	None
14:15	5	25	200	28.40	1.59	7.24	0.847	55.9	0.95	11.1	-79.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	6	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-136			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.02	**Total Depth (ft-bmp)**	13.73	**Water Column (ft)**	5.71	**Gallons in Well**	0.93
Purge Start	09:25	**Pump Intake (ft-bmp)**	11.23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:05	**Volumes Purged**	2.27	**Sample ID**	MW-21-136_103023	**Sampled by**	Austin Westhuis
Sample Time	10:00	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	200	9.00	0.26	7.4	0.936	7.57	0.82	14.3	-62.9	Clear	None
09:35	5	5	200	9.00	0.53	7.37	0.93	7.01	0.57	13.6	-65.1	Clear	None
09:40	5	10	200	9.00	0.79	7.36	0.922	6.27	0.59	13.6	-63.1	Clear	None
09:45	5	15	200	9.00	1.06	7.39	0.922	5.89	0.51	13.5	-49.4	Clear	None
09:50	5	20	200	9.00	1.32	7.37	0.925	5.14	0.5	13.6	-43.5	Clear	None
09:55	5	25	200	9.00	1.59	7.34	0.932	4.42	0.49	13.6	-48.7	Clear	None
10:00	5	30	200	9.00	1.85	7.33	0.93	4.34	0.47	13.6	-53.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-137			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing NW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.55	**Total Depth (ft-bmp)**	11.5	**Water Column (ft)**	1.95	**Gallons in Well**	0.32
Purge Start	10:20	**Pump Intake (ft-bmp)**	10.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**	6.60	**Sample ID**	MW-21-137_103023	**Sampled by**	Austin Westhuis
Sample Time	10:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:25	0	0	200	9.92	0.26	6.98	0.993	9.91	1.16	13.6	82.5	Clear	None
10:30	5	5	200	9.97	0.53	6.93	0.977	5.27	0.64	13.9	86.6	Clear	None
10:35	5	10	200	9.97	0.79	6.91	0.972	5.14	0.55	13.7	89.5	Clear	None
10:40	5	15	200	9.97	1.06	6.89	0.964	4.65	0.5	13.7	93.6	Clear	None
10:45	5	20	200	9.97	1.32	6.88	0.956	4.01	0.46	13.9	95.8	Clear	None
10:50	5	25	200	9.97	1.59	6.88	0.958	3.73	0.45	13.9	99.8	Clear	None
10:55	5	30	200	9.97	1.85	6.88	0.955	3.46	0.44	13.9	100.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-138			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Mostly Cloudy. The wind is blowing N/NW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.70	**Total Depth (ft-bmp)**	28.65	**Water Column (ft)**	6.95	**Gallons in Well**	1.13
Purge Start	11:05	**Pump Intake (ft-bmp)**	26.15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:40	**Volumes Purged**	1.64	**Sample ID**	MW-21-138_103023	**Sampled by**	Austin Westhuis
Sample Time	11:35	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:10	0	0	200	22.31	0.26	7.01	1.601	25.75	1.02	11.9	-49.7	Clear	None
11:15	5	5	200	22.76	0.53	7.02	1.607	24.42	0.46	11.6	-41	Clear	None
11:20	5	10	200	23.25	0.79	7.03	1.558	18.38	0.34	11.5	-39	Clear	None
11:25	5	15	200	23.76	1.06	7.04	1.53	16.89	0.3	11.4	-36.6	Clear	None
11:30	5	20	200	23.81	1.32	7.04	1.509	15.88	0.29	11.5	-34.6	Clear	None
11:35	5	25	200	23.84	1.59	7.04	1.487	15.71	0.29	11.5	-34.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-139			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	63.0 degrees F and Cloudy. The wind is blowing SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.02	**Total Depth (ft-bmp)**	15.36	**Water Column (ft)**	12.34	**Gallons in Well**	2.01
Purge Start	11:30	**Pump Intake (ft-bmp)**	12.86	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:10	**Volumes Purged**	1.05	**Sample ID**	MW-21-139_102523	**Sampled by**	Austin Westhuis
Sample Time	12:05	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	200	4.16	0.26	8.17	1.523	21.14	0.53	17	-49.7	Clear	None
11:40	5	5	200	4.56	0.53	8.11	1.446	19.33	0.3	17	-76.9	Clear	None
11:45	5	10	200	4.71	0.79	7.97	1.395	11.94	0.25	17	-113.5	Clear	None
11:50	5	15	200	4.95	1.06	7.89	1.356	4.43	0.23	17	-114.8	Clear	None
11:55	5	20	200	4.99	1.32	7.77	1.31	2.63	0.23	17	-111.9	Clear	None
12:00	5	25	200	5.02	1.59	7.75	1.308	2.11	0.22	17.1	-111.8	Clear	None
12:05	5	30	200	5.02	1.85	7.73	1.304	1.79	0.22	17.1	-112	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-140			**Date**	10/28/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Cloudy. The wind is blowing N/NW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	69.14	**Total Depth (ft-bmp)**	75.97	**Water Column (ft)**	6.83	**Gallons in Well**	1.11
Purge Start	10:45	**Pump Intake (ft-bmp)**	73.47	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:25	**Volumes Purged**	1.90	**Sample ID**	MW-21-140_102823	**Sampled by**	Austin Westhuis
Sample Time	11:20	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:50	0	0	200	69.33	0.26	7.26	0.816	207.64	1.22	13.1	-34.5	Clear	None
10:55	5	5	200	69.38	0.53	7.26	0.811	99.83	1.3	13.1	-30.5	Clear	None
11:00	5	10	200	69.38	0.79	7.22	0.816	33.19	0.92	13.1	-32.2	Clear	None
11:05	5	15	200	69.38	1.06	7.21	0.818	18.16	0.76	13	-34.7	Clear	None
11:10	5	20	200	69.38	1.32	7.19	0.821	12.02	0.48	13	-38.2	Clear	None
11:15	5	25	200	69.38	1.59	7.18	0.822	11.56	0.45	13.1	-41.3	Clear	None
11:20	5	30	200	69.38	1.85	7.18	0.823	11.22	0.44	13.1	-42.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-141			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	78.16	**Total Depth (ft-bmp)**	79.72	**Water Column (ft)**	1.56	**Gallons in Well**	0.25
Purge Start	09:45	**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:35	**Volumes Purged**		**Sample ID**	MW-21-141_103023	**Sampled by**	Donald Richmond
Sample Time	10:30	**Gallons Purged**		**Replicate/ Code No.**	DUP-13_103023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	200	78.16	0.00							Gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	6	HCL

Comments: Well went dry, sampled recharge

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-21-142			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing W/NW at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.80	**Total Depth (ft-bmp)**	78.9	**Water Column (ft)**	11.10	**Gallons in Well**	1.80
Purge Start	14:50	**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:50	**Volumes Purged**	0.88	**Sample ID**	MW-21-142_103023	**Sampled by**	Billy Cobern
Sample Time	15:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	100	68.10	0.13	6.58	2.839	8477.26	1.13	11.6	3.6	Orange	None
15:00	5	5	100	68.10	0.26	6.56	2.89	10515.85	0.36	11.6	0	Orange	None
15:05	5	10	100	68.10	0.40	6.54	2.893	12375.95	0.04	12.5	5.5	Orange	None
15:10	5	15	100	68.10	0.53	6.55	2.918	4322.57	0.41	11.8	14.1	Orange	None
15:15	5	20	100	68.10	0.66	6.72	2.939	1107.85	2.84	11.8	11.2	Orange	None
15:20	5	25	100	68.10	0.79	6.55	2.925	688.47	0.22	11.7	11.7	Orange	None
15:25	5	30	100	68.10	0.92	6.54	2.917	583.42	0.14	11.6	9.1	Orange	None
15:30	5	35	100	68.10	1.06	6.55	2.899	368.68	0.08	12	5.4	Orange	None
15:35	5	40	100	68.10	1.19	6.55	2.891	267.48	0.06	12	-1	Orange	None
15:40	5	45	100	68.10	1.32	6.55	2.863	247.25	0.05	11.8	-4	Orange	None
15:45	5	50	100	68.10	1.45	6.56	2.835	236.21	0.3	11.6	0.7	Orange	None
15:50	5	55	100	68.10	1.59	6.56	2.821	167.31	0.21	11.7	-0.5	Orange	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Thick iron in well. Didn't meet stabilization criteria.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-143			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing NW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.80	**Total Depth (ft-bmp)**	31.02	**Water Column (ft)**	13.22	**Gallons in Well**	2.15
Purge Start	13:10	**Pump Intake (ft-bmp)**	28.52	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:45	**Volumes Purged**	0.86	**Sample ID**	MW-22-143_103023	**Sampled by**	Austin Westhuis
Sample Time	13:40	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:15	0	0	200	18.18	0.26	7.13	2.964	30.05	0.36	12.8	-74.7	Clear	None
13:20	5	5	200	18.18	0.53	7.13	2.969	28.69	0.35	13.1	-75.1	Clear	None
13:25	5	10	200	18.18	0.79	7.12	3.024	23.82	0.3	13.5	-75.8	Clear	None
13:30	5	15	200	18.18	1.06	7.12	3.082	21.94	0.28	13.3	-76.3	Clear	None
13:35	5	20	200	18.18	1.32	7.12	3.095	21.39	0.27	13.1	-76.8	Clear	None
13:40	5	25	200	18.18	1.59	7.12	3.14	20.79	0.26	13.1	-77.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-144			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing W/NW at 15.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.40	**Total Depth (ft-bmp)**	24.08	**Water Column (ft)**	10.68	**Gallons in Well**	1.74
Purge Start	14:50	**Pump Intake (ft-bmp)**	21.58	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:35	**Volumes Purged**	1.37	**Sample ID**	MW-22-144_103023	**Sampled by**	Austin Westhuis
Sample Time	15:25	**Gallons Purged**	2.377548	**Replicate/ Code No.**	DUP-15_103023	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	200	14.16	0.26	7.23	1.31	49.02	0.76	14.2	66.4	Clear	None
15:00	5	5	200	14.21	0.53	7.21	1.313	20.12	0.47	14.1	62.6	Clear	None
15:05	5	10	200	14.21	0.79	7.2	1.32	13.41	0.39	14.2	59.9	Clear	None
15:10	5	15	200	14.21	1.06	7.19	1.327	8.55	0.34	14.3	58.3	Clear	None
15:15	5	20	200	14.21	1.32	7.19	1.328	7.12	0.32	14.4	57.3	Clear	None
15:20	5	25	200	14.21	1.59	7.19	1.327	6.98	0.31	14.2	57.4	Clear	None
15:25	5	30	200	14.21	1.85	7.18	1.334	6.47	0.29	14.2	57.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-145			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing W at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.32	**Total Depth (ft-bmp)**	14.85	**Water Column (ft)**	1.53	**Gallons in Well**	0.25
Purge Start	15:40	**Pump Intake (ft-bmp)**	13.85	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:15	**Volumes Purged**	7.40	**Sample ID**	MW-22-145_103023	**Sampled by**	Austin Westhuis
Sample Time	16:10	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:45	0	0	200	13.41	0.26	7.2	1.222	9.78	0.51	15	-25.1	Clear	None
15:50	5	5	200	13.41	0.53	7.2	1.229	7.71	0.41	14.8	-19.4	Clear	None
15:55	5	10	200	13.41	0.79	7.19	1.229	5.12	0.34	15	-12.2	Clear	None
16:00	5	15	200	13.41	1.06	7.19	1.227	4.61	0.3	15.1	-7.3	Clear	None
16:05	5	20	200	13.41	1.32	7.19	1.225	3.68	0.29	15.1	-5.1	Clear	None
16:10	5	25	200	13.41	1.59	7.19	1.217	3.65	0.29	15.1	1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-146			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing S at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.21	**Total Depth (ft-bmp)**	10.5	**Water Column (ft)**	4.29	**Gallons in Well**	0.70
Purge Start	10:05	**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**	2.08	**Sample ID**	MW-22-146_103123	**Sampled by**	Billy Cobern
Sample Time	11:00	**Gallons Purged**	1.452946	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	100	6.36	0.13	7.42	0.967	141.17	4.86	12.8	71.8	Clear	None
10:15	5	5	100	6.41	0.26	7.21	0.971	97.49	3.09	12.7	66.7	Clear	None
10:20	5	10	100	6.45	0.40	7.2	0.965	79.63	3.15	13	66.9	Clear	None
10:25	5	15	100	6.49	0.53	7.2	0.967	73.59	3.28	12.8	69.1	Clear	None
10:30	5	20	100	6.51	0.66	7.2	0.967	36.15	4.87	12.8	78.1	Clear	None
10:35	5	25	100	6.51	0.79	7.2	0.965	21.65	5.42	12.7	90.2	Clear	None
10:40	5	30	100	6.51	0.92	7.2	0.96	18.52	5.65	12.8	96.7	Clear	None
10:45	5	35	100	6.51	1.06	7.2	0.955	12.23	5.96	12.9	104.1	Clear	None
10:50	5	40	100	6.51	1.19	7.2	0.952	9.23	5.95	13.1	105.7	Clear	None
10:55	5	45	100	6.51	1.32	7.2	0.949	9.1	6.07	13.1	107.7	Clear	None
11:00	5	50	100	6.51	1.45	7.2	0.951	8.74	6.06	13	108.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-147			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	35.1 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.25	**Total Depth (ft-bmp)**	12.2	**Water Column (ft)**	2.95	**Gallons in Well**	0.48
Purge Start	11:30	**Pump Intake (ft-bmp)**	11.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:10	**Volumes Purged**	2.20	**Sample ID**	MW-22-147_103123	**Sampled by**	Billy Cobern
Sample Time	12:10	**Gallons Purged**	1.056688	**Replicate/ Code No.**	MW-22-147_103123	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	100	9.48	0.13	7.33	1.483	211.84	4.07	13.8	145.5	Clear	None
11:40	5	5	100	9.52	0.26	7.16	1.521	47.33	1.35	14.5	114	Clear	None
11:45	5	10	100	9.54	0.40	7.13	1.527	18.81	1.69	14.4	96.8	Clear	None
11:50	5	15	100	9.56	0.53	7.12	1.529	14.01	1.83	14.3	92.5	Clear	None
11:55	5	20	100	9.56	0.66	7.11	1.54	9.26	2.13	14.3	89.7	Clear	None
12:00	5	25	100	9.56	0.79	7.1	1.541	9.33	2.42	14.3	90.6	Clear	None
12:05	5	30	100	9.56	0.92	7.1	1.543	9.66	2.44	14.4	92	Clear	None
12:10	5	35	100	9.56	1.06	7.1	1.54	9.52	2.46	14.5	92.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	6	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-148			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing S/SW at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.30	**Total Depth (ft-bmp)**	29.3	**Water Column (ft)**	4.00	**Gallons in Well**	0.65
Purge Start	12:35	**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:35	**Volumes Purged**	2.44	**Sample ID**	MW-22-148_103123	**Sampled by**	Billy Cobern
Sample Time	13:35	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:40	0	0	100	25.95	0.13	7.27	0.962	226.75	3.08	11.3	89.6	Clear	None
12:45	5	5	100	26.17	0.26	7.2	0.931	172.42	1.51	11.1	96.6	Clear	None
12:50	5	10	100	26.36	0.40	7.17	0.921	152.62	1.12	11.3	99.1	Clear	None
12:55	5	15	100	26.46	0.53	7.16	0.916	117.42	0.99	11.2	99.6	Clear	None
13:00	5	20	100	26.55	0.66	7.15	0.905	68.53	0.73	11.2	98.2	Clear	None
13:05	5	25	100	26.65	0.79	7.14	0.898	38.47	0.58	11.1	95.1	Clear	None
13:10	5	30	100	26.73	0.92	7.13	0.898	43.66	0.54	10.8	92.6	Clear	None
13:15	5	35	100	26.85	1.06	7.13	0.893	23.87	0.65	10.9	89.4	Clear	None
13:20	5	40	100	26.93	1.19	7.12	0.897	19.28	0.76	11.6	86.5	Clear	None
13:25	5	45	100	27.02	1.32	7.12	0.893	16.77	0.74	11.7	86.1	Clear	None
13:30	5	50	100	27.09	1.45	7.13	0.893	16.54	0.69	11.8	85.9	Clear	None
13:35	5	55	100	27.15	1.59	7.11	0.893	14.56	0.68	11.7	85.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Stabilization criteria not met.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-149			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Mostly Cloudy. The wind is blowing S at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.05	**Total Depth (ft-bmp)**	9.9	**Water Column (ft)**	4.85	**Gallons in Well**	0.79
Purge Start	14:10	**Pump Intake (ft-bmp)**	8	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:35	**Volumes Purged**	0.84	**Sample ID**	MW-22-149_103123	**Sampled by**	Billy Cobern
Sample Time	14:35	**Gallons Purged**	0.6604301	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:15	0	0	100	5.38	0.13	7.36	0.565	51.24	7.53	13.7	147.1	Clear	None
14:20	5	5	100	5.35	0.26	7.22	0.554	15.98	6.64	14.1	151.4	Clear	None
14:25	5	10	100	5.35	0.40	7.21	0.551	5.8	6.55	13.7	155.5	Clear	None
14:30	5	15	100	5.35	0.53	7.2	0.548	5.62	6.56	13.7	157.6	Clear	None
14:35	5	20	100	5.35	0.66	7.2	0.549	5.04	6.56	13.6	158.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-150			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Mostly Cloudy. The wind is blowing S at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.55	**Total Depth (ft-bmp)**	17.95	**Water Column (ft)**	12.40	**Gallons in Well**	2.01
Purge Start	14:50	**Pump Intake (ft-bmp)**	15.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:50	**Volumes Purged**	0.79	**Sample ID**	MW-22-150_103123	**Sampled by**	Billy Cobern
Sample Time	15:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	100	6.17	0.13	7.09	4.137	23.16	1.16	13.6	176.84	Clear	None
15:00	5	5	100	6.69	0.26	7.08	4.354	17.65	0.39	14.1	166.5	Clear	None
15:05	5	10	100	7.11	0.40	7.1	4.365	16.87	0.27	14	151.8	Clear	None
15:10	5	15	100	7.59	0.53	7.13	4.357	12.85	0.21	13.9	125.8	Clear	None
15:15	5	20	100	7.99	0.66	7.13	4.365	12.39	0.24	13.8	88.7	Clear	None
15:20	5	25	100	8.37	0.79	7.14	4.371	13.73	0.38	13.8	61.2	Clear	None
15:25	5	30	100	8.69	0.92	7.14	4.383	16.68	0.59	13.8	35.3	Clear	None
15:30	5	35	100	8.98	1.06	7.15	4.391	18.81	0.74	13.9	26.3	Clear	None
15:35	5	40	100	9.21	1.19	7.15	4.394	21.91	0.87	14	21.6	Clear	None
15:40	5	45	100	9.48	1.32	7.15	4.405	27.29	0.92	14	17.1	Clear	None
15:45	5	50	100	9.68	1.45	7.15	4.411	33.14	0.93	14.2	13.1	Clear	None
15:50	5	55	100	9.85	1.59	7.14	4.413	38.26	0.9	14.4	9.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Stabilization criteria not met.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-151			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	34.0 degrees F and Light Snow. The wind is blowing S/SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.12	**Total Depth (ft-bmp)**	12.5	**Water Column (ft)**	6.38	**Gallons in Well**	1.04
Purge Start	16:10	**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:45	**Volumes Purged**	0.89	**Sample ID**	MW-22-151_103123	**Sampled by**	Billy Cobern
Sample Time	16:45	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:15	0	0	100	6.43	0.13	6.67	2.913	10.55	0.52	14.6	-21.9	Clear	None
16:20	5	5	100	6.43	0.26	6.65	2.895	9.63	0.3	15	-30.4	Clear	None
16:25	5	10	100	6.43	0.40	6.65	2.907	9.41	0.21	14.9	-40	Clear	None
16:30	5	15	100	6.43	0.53	6.65	2.896	9.87	0.16	15.1	-44.5	Clear	None
16:35	5	20	100	6.43	0.66	6.65	2.898	9.25	0.13	15.2	-49.8	Clear	None
16:40	5	25	100	6.43	0.79	6.65	2.897	9.03	0.13	15.1	-52.9	Clear	None
16:45	5	30	100	6.43	0.92	6.65	2.891	8.9	0.13	15.3	-54.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-152			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing S/SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.48	**Total Depth (ft-bmp)**	14.9	**Water Column (ft)**	7.42	**Gallons in Well**	1.21
Purge Start	10:05	**Pump Intake (ft-bmp)**	12.4	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:45	**Volumes Purged**	1.75	**Sample ID**	MW-22-152_102723	**Sampled by**	Austin Westhuis
Sample Time	10:35	**Gallons Purged**	2.113376	**Replicate/ Code No.**	DUP-16_102723	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	200	7.50	0.26	7.09	1.068	15.46	0.3	16.1	139.5	Clear	None
10:15	5	5	200	7.50	0.53	7.09	1.066	11.12	0.23	16.1	137.9	Clear	None
10:20	5	10	200	7.50	0.79	7.08	1.064	6.67	0.21	16.2	136.8	Clear	None
10:25	5	15	200	7.50	1.06	7.08	1.062	3.97	0.18	16.2	135.9	Clear	None
10:30	5	20	200	7.50	1.32	7.09	1.062	3.61	0.17	16.1	134.3	Clear	None
10:35	5	25	200	7.50	1.59	7.1	1.062	3.12	0.17	16.1	133.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None
VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-153			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.78	**Total Depth (ft-bmp)**	31.15	**Water Column (ft)**	20.37	**Gallons in Well**	3.31
Purge Start	13:25	**Pump Intake (ft-bmp)**	29.15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:05	**Volumes Purged**	0.48	**Sample ID**	MW-22-153_102423	**Sampled by**	Donald Richmond
Sample Time	14:00	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	200	10.78	0.26	7.15	1.337	10	0.12	15.8	3.3	Clear	None
13:35	5	5	200	10.78	0.53	7.14	1.332	27	0.05	15.6	-15	Clear	None
13:40	5	10	200	10.78	0.79	7.11	1.309	30	0	15.2	-43.3	Clear	None
13:45	5	15	200	10.78	1.06	7.09	1.345	39.27	0	15.1	-51	Clear	None
13:50	5	20	200	10.78	1.32	7.03	1.522	38	0	15.3	-55.4	Clear	None
13:55	5	25	200	10.78	1.59	7.02	1.562	36	0	15.2	-58.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-154			**Date**	10/27/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing S/SW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.09	**Total Depth (ft-bmp)**	10.58	**Water Column (ft)**	5.49	**Gallons in Well**	0.89
Purge Start	10:55	**Pump Intake (ft-bmp)**	8.08	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:30	**Volumes Purged**	2.08	**Sample ID**	MW-22-154_102723	**Sampled by**	Austin Westhuis
Sample Time	11:25	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:00	0	0	200	5.11	0.26	6.64	12.323	43.14	0.63	15.8	34.3	Clear	None
11:05	5	5	200	5.11	0.53	6.7	12.136	21.32	0.33	15.7	40.8	Clear	None
11:10	5	10	200	5.11	0.79	6.74	11.976	10.79	0.25	15.7	46.7	Clear	None
11:15	5	15	200	5.11	1.06	6.75	12.005	4.63	0.22	15.7	55.2	Clear	None
11:20	5	20	200	5.11	1.32	6.76	12.011	4.09	0.21	15.7	54.3	Clear	None
11:25	5	25	200	5.11	1.59	6.76	12.019	3.89	0.21	15.7	54	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-155			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	72.0 degrees F and Cloudy. The wind is blowing W/SW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.53	**Total Depth (ft-bmp)**	31.5	**Water Column (ft)**	19.97	**Gallons in Well**	3.24
Purge Start	14:35	**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:25	**Volumes Purged**	0.82	**Sample ID**	MW-22-155_102423	**Sampled by**	Austin Westhuis
Sample Time	15:20	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:40	0	0	200	11.59	0.26	7.04	2.285	226.45	0.21	15.3	-96	Clear	None
14:45	5	5	200	11.59	0.53	7.04	2.319	186.37	0.15	15.3	-103.3	Clear	None
14:50	5	10	200	11.59	0.79	7.03	2.341	149.65	0.13	15.3	-110.3	Clear	None
14:55	5	15	200	11.59	1.06	7.03	2.355	136.01	0.12	15.3	-111.1	Clear	None
15:00	5	20	200	11.59	1.32	7.03	2.37	101.12	0.11	15.4	-113.8	Clear	None
15:05	5	25	200	11.59	1.59	7.03	2.38	81.94	0.11	15.4	-114.3	Clear	None
15:10	5	30	200	11.59	1.85	7.03	2.402	67.35	0.11	15.3	-116.1	Clear	None
15:15	5	35	200	11.59	2.11	7.03	2.408	65.84	0.11	15.3	-116.8	Clear	None
15:20	5	40	200	11.59	2.38	7.03	2.41	64.94	0.11	15.3	-117.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-156			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.71	**Total Depth (ft-bmp)**	31.04	**Water Column (ft)**	18.33	**Gallons in Well**	2.98
Purge Start	14:15	**Pump Intake (ft-bmp)**	29.04	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:20	**Volumes Purged**	0.98	**Sample ID**	MW-22-156_102423	**Sampled by**	Donald Richmond
Sample Time	15:15	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	200	12.71	0.53	7.3	1.219	35	0.32	18.7	-16.2	Clear	None
14:30	5	5	200	12.71	0.79	7.16	1.51	89	0.08	18.6	61.9	Clear	None
14:35	5	10	200	12.71	1.06	7.13	1.639	187	0.01	18.5	-73.4	Clear	None
14:40	5	15	200	12.71	1.32	7.13	1.655	218	0	18.5	-76.1	Clear	None
14:45	5	20	200	12.71	1.59	7.12	1.67	255	0	18.5	-77.9	Clear	None
14:50	5	25	200	12.71	1.85	7.12	1.674	274	0	18.4	-81	Clear	None
14:55	5	30	200	12.71	2.11	7.12	1.67	300	0	18.2	-83.4	Clear	None
15:00	5	35	200	12.71	2.38	7.1	1.698	45	0	18.3	-84.9	Clear	None
15:05	5	40	200	12.71	2.64	7.1	1.702	193	0	18.2	-86.8	Clear	None
15:10	5	45	200	12.71	2.91	7.1	1.699	261	0	18.2	-88.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-157			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.25	**Total Depth (ft-bmp)**	27.55	**Water Column (ft)**	25.30	**Gallons in Well**	4.11
Purge Start	15:35	**Pump Intake (ft-bmp)**	25.55	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:35	**Volumes Purged**	0.64	**Sample ID**	MW-22-157_102423	**Sampled by**	Donald Richmond
Sample Time	16:30	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:40	0	0	200	2.25	0.26	7.09	1.352	4.32	0.37	18.4	59	Clear	None
15:45	5	5	200	2.25	0.53	7.06	1.344	6.13	0.21	18	24	Clear	None
15:50	5	10	200	2.25	0.79	7.03	1.319	16	0	17.6	-19	Clear	None
15:55	5	15	200	2.25	1.06	7.01	1.304	34	0	17.3	-37.3	Clear	None
16:00	5	20	200	2.25	1.32	7	1.294	59	0	17	-44.7	Clear	None
16:05	5	25	200	2.25	1.59	6.99	1.292	121	0	17	-51.1	Clear	None
16:10	5	30	200	2.25	1.85	6.98	1.285	264	0	16.8	-56	Clear	None
16:15	5	35	200	2.25	2.11	6.97	1.291	54	0	16.5	-59.2	Clear	None
16:20	5	40	200	2.25	2.38	6.96	1.29	120	-0.22	16.4	-61.3	Clear	None
16:25	5	45	200	2.25	2.64	6.95	16.2	108	0	16.2	-63.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-158			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	39.0 degrees F and Cloudy. The wind is blowing NW at 13.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	16.75	**Total Depth (ft-bmp)**	20.15	**Water Column (ft)**	3.40	**Gallons in Well**	0.55
Purge Start	14:05	**Pump Intake (ft-bmp)**	17.65	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:40	**Volumes Purged**	3.36	**Sample ID**	MW-22-158_103023	**Sampled by**	Austin Westhuis
Sample Time	14:35	**Gallons Purged**	1.849204	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:10	0	0	200	16.85	0.26	7.11	3.797	42.31	0.69	12.9	5	Clear	None
14:15	5	5	200	16.85	0.53	7.11	3.848	31.06	0.44	12.7	0.9	Clear	None
14:20	5	10	200	16.85	0.79	7.11	3.813	16.6	0.31	12.9	-5.5	Clear	None
14:25	5	15	200	16.85	1.06	7.11	3.794	15.66	0.28	12.9	-7.9	Clear	None
14:30	5	20	200	16.85	1.32	7.11	3.743	15.11	0.28	12.9	-10.9	Clear	None
14:35	5	25	200	16.85	1.59	7.11	3.726	14.66	0.27	12.9	-12	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-22-160			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	32.0 degrees F and Cloudy. The wind is blowing S at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.84	**Total Depth (ft-bmp)**	19	**Water Column (ft)**	4.16	**Gallons in Well**	0.68
Purge Start	09:05	**Pump Intake (ft-bmp)**	17.5	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:50	**Volumes Purged**	1.75	**Sample ID**	MW-22-160_103123	**Sampled by**	Billy Cobern
Sample Time	09:50	**Gallons Purged**	1.188774	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:10	0	0	100	14.94	0.13	6.83	1.291	45.44	0.68	13.1	-7	Clear	None
09:15	5	5	100	14.94	0.26	6.82	1.286	38.95	0.54	13.3	-14.3	Clear	None
09:20	5	10	100	14.94	0.40	6.81	1.283	27.67	0.42	13.3	-19.5	Clear	None
09:25	5	15	100	14.94	0.53	6.81	1.278	22.59	0.31	13.4	-24.4	Clear	None
09:30	5	20	100	14.94	0.66	6.8	1.272	15.43	0.26	13.5	-29.1	Clear	None
09:35	5	25	100	14.94	0.79	6.79	1.267	10.71	0.2	13.4	-36.2	Clear	None
09:40	5	30	100	14.94	0.92	6.79	1.265	9.73	0.16	13.7	-40.7	Clear	None
09:45	5	35	100	14.94	1.06	6.78	1.265	9.23	0.15	13.6	-42.1	Clear	None
09:50	5	40	100	14.94	1.19	6.78	1.262	8.93	0.15	13.6	-42.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-23			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	48.92	**Total Depth (ft-bmp)**	61.35	**Water Column (ft)**	12.43	**Gallons in Well**	2.02
Purge Start	13:55	**Pump Intake (ft-bmp)**	59.35	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:00	**Volumes Purged**	1.44	**Sample ID**	MW-23_110323	**Sampled by**	Donald Richmond
Sample Time	14:55	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:05	0	0	200	48.92	0.53	11.77	0.93	6.89	8.28	13.9	-25.9	Clear	None
14:10	5	5	200	48.92	0.79	11.7	0.838	8	6.89	13.9	-28.7	Clear	None
14:15	5	10	200	48.92	1.06	11.17	0.541	34	5.98	14.1	-29.3	Clear	None
14:20	5	15	200	48.92	1.32	10.03	0.479	41	4.88	13.9	-4.9	Clear	None
14:25	5	20	200	48.92	1.59	9.67	0.499	45.93	4.63	13.9	7.6	Clear	None
14:30	5	25	200	48.92	1.85	9.3	0.534	45.79	4.26	13.9	20.4	Clear	None
14:35	5	30	200	48.92	2.11	8.95	0.577	44	3.82	13.8	30.9	Clear	None
14:40	5	35	200	48.92	2.38	8.16	0.725	36	2.52	13.8	43.5	Clear	None
14:45	5	40	200	48.92	2.64	7.49	0.98	10.46	0.87	13.8	47.9	Clear	None
14:50	5	45	200	48.92	2.91	7.23	1.037	7.34	0.2	13.8	-7.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-23-161			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Clear. The wind is blowing SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.57	**Total Depth (ft-bmp)**	27.57	**Water Column (ft)**	17.00	**Gallons in Well**	2.76
Purge Start	11:15	**Pump Intake (ft-bmp)**	25.07	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:55	**Volumes Purged**	0.77	**Sample ID**	MW-23-161_102423	**Sampled by**	Austin Westhuis
Sample Time	11:50	**Gallons Purged**	2.113376	**Replicate/ Code No.**	DUP-03_102423	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:20	0	0	200	10.68	0.26	7.05	2.226	53.55	0.72	14.8	-48.8	Clear	None
11:25	5	5	200	10.68	0.53	7.06	2.187	47.46	0.46	14.5	-53.5	Clear	None
11:30	5	10	200	10.68	0.79	7.11	1.96	39.73	0.3	14.1	-58.2	Clear	None
11:35	5	15	200	10.68	1.06	7.13	1.805	37.12	0.25	14	-62.8	Clear	None
11:40	5	20	200	10.68	1.32	7.14	1.781	23.44	0.2	14.1	-67.8	Clear	None
11:45	5	25	200	10.68	1.59	7.13	1.78	22.51	0.19	14.2	-74.7	Clear	None
11:50	5	30	200	10.68	1.85	7.13	1.78	22.19	0.19	14.1	-75.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-23-162			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Clear. The wind is blowing SW at 10.3 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.18	**Total Depth (ft-bmp)**	36.63	**Water Column (ft)**	22.45	**Gallons in Well**	3.65
Purge Start	12:20	**Pump Intake (ft-bmp)**	34.13	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:00	**Volumes Purged**	0.58	**Sample ID**	MW-23-162_102423	**Sampled by**	Austin Westhuis
Sample Time	12:55	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:25	0	0	200	14.58	0.26	6.85	3.134	49.55	0.83	14.9	1.6	Clear	None
12:30	5	5	200	15.93	0.53	6.85	3.119	99.08	0.24	14.2	-7	Clear	None
12:35	5	10	200	16.15	0.79	6.85	3.106	121.62	0.26	14.2	-4.6	Clear	None
12:40	5	15	200	16.40	1.06	6.86	3.096	77.33	0.42	14	-2.1	Clear	None
12:45	5	20	200	16.57	1.32	6.86	3.1	20.11	0.62	14.1	-0.2	Clear	None
12:50	5	25	200	16.72	1.59	6.86	3.1	19.57	0.59	14.1	-1.1	Clear	None
12:55	5	30	200	16.76	1.85	6.89	3.097	19.08	0.57	14	-4.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-23-163			**Date**	10/24/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	72.0 degrees F and Mostly Clear. The wind is blowing S at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.48	**Total Depth (ft-bmp)**	27.23	**Water Column (ft)**	13.75	**Gallons in Well**	2.23
Purge Start	13:35	**Pump Intake (ft-bmp)**	24.73	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:15	**Volumes Purged**	0.95	**Sample ID**	MW-23-163_102423	**Sampled by**	Austin Westhuis
Sample Time	14:10	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	200	13.80	0.26	7.29	1.194	182.81	0.56	14.2	-87.8	Clear	None
13:45	5	5	200	13.80	0.53	7.28	1.167	145.81	0.27	14.2	-93.2	Clear	None
13:50	5	10	200	13.80	0.79	7.26	1.184	83.92	0.19	14.2	-92.1	Clear	None
13:55	5	15	200	13.80	1.06	7.26	1.186	77.66	0.16	14.2	-93.6	Clear	None
14:00	5	20	200	13.80	1.32	7.24	1.207	57.11	0.12	14.2	-99.9	Clear	None
14:05	5	25	200	13.80	1.59	7.23	1.213	56.51	0.11	14.2	-100.9	Clear	None
14:10	5	30	200	13.80	1.85	7.23	1.225	53.91	0.11	14.2	-102.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM,VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	MW-91-2R			**Date**	11/3/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.77	**Total Depth (ft-bmp)**	84.2	**Water Column (ft)**	26.43	**Gallons in Well**	4.29
Purge Start	15:20	**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:25	**Volumes Purged**	0.68	**Sample ID**	MW-91-2R_110323	**Sampled by**	Donald Richmond
Sample Time	16:20	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:30	0	0	200	57.77	0.53	7.1	1.055	5.09	1.76	14.4	105.4	Clear	None
15:35	5	5	200	57.77	0.79	7.08	1.067	4.97	0.71	14.3	102.1	Clear	None
15:40	5	10	200	57.77	1.06	7.07	1.075	5.81	0.43	14.3	99.3	Clear	None
15:45	5	15	200	57.77	1.32	7.05	1.107	5.2	0.07	14.4	89.3	Clear	None
15:50	5	20	200	57.77	1.59	7.05	1.126	5.23	0	14.3	64.6	Clear	None
15:55	5	25	200	57.77	1.85	7.05	1.141	5.19	0	14.4	42	Clear	None
16:00	5	30	200	57.77	2.11	7.04	1.181	5.96	0	14.4	-30	Clear	None
16:05	5	35	200	57.77	2.38	7.03	1.258	9.78	0	14.3	-64.4	Clear	None
16:10	5	40	200	57.77	2.64	7.02	1.338	28	-0.19	14.2	-81	Clear	None
16:15	5	45	200	57.77	2.91	7.03	1.373	24	0	14.1	-90.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	P2-MW-02			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	62.1 degrees F and Cloudy. The wind is blowing S at 6.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	36.19	**Total Depth (ft-bmp)**	40.22	**Water Column (ft)**	4.03	**Gallons in Well**	0.65
Purge Start	09:50	**Pump Intake (ft-bmp)**	38.22	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:45	**Volumes Purged**	4.47	**Sample ID**	P2-MW-02_102523	**Sampled by**	Austin Westhuis
Sample Time	10:30	**Gallons Purged**	2.9058926	**Replicate/ Code No.**	MS/MSD	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:55	0	0	200	37.26	0.26	7.18	1.347	18.77	1.01	13.9	-31.6	Clear	None
10:00	5	5	200	37.60	0.53	7.19	1.342	21.77	0.44	14.1	-45	Clear	None
10:05	5	10	200	37.60	0.79	7.2	1.334	14.51	0.42	14.1	-59.6	Clear	None
10:10	5	15	200	37.60	1.06	7.2	1.316	12.17	0.4	14.1	-66	Clear	None
10:15	5	20	200	37.60	1.32	7.2	1.31	11.61	0.32	14.2	-73.6	Clear	None
10:20	5	25	200	37.60	1.59	7.21	1.3	11.13	0.28	14.2	-79.8	Clear	None
10:25	5	30	200	37.60	1.85	7.22	1.29	10.32	0.28	14.2	-85.2	Clear	None
10:30	5	35	200	37.60	2.11	7.23	1.272	10.22	0.28	14.2	-87.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	6	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	P2-MW-04			**Date**	10/25/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Cloudy. The wind is blowing S/SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.88	**Total Depth (ft-bmp)**	39.64	**Water Column (ft)**	28.76	**Gallons in Well**	4.67
Purge Start	13:00	**Pump Intake (ft-bmp)**	37.14	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:40	**Volumes Purged**	0.45	**Sample ID**	P2-MW-04_102523	**Sampled by**	Austin Westhuis
Sample Time	13:35	**Gallons Purged**	2.113376	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:05	0	0	200	11.17	0.26	7.36	1.226	13.42	0.74	14.5	-99.2	Clear	None
13:10	5	5	200	11.17	0.53	7.37	1.224	11.62	0.43	14.5	-101.1	Clear	None
13:15	5	10	200	11.17	0.79	7.38	1.22	10.02	0.28	14.3	-103.5	Clear	None
13:20	5	15	200	11.17	1.06	7.38	1.207	9.14	0.23	14.3	-106.6	Clear	None
13:25	5	20	200	11.17	1.32	7.38	1.207	8.79	0.2	14.2	-107.6	Clear	None
13:30	5	25	200	11.17	1.59	7.38	1.211	8.42	0.19	14.2	-108.1	Clear	None
13:35	5	30	200	11.17	1.85	7.37	1.213	8.02	0.19	14.2	-109.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-dioxane	40 mL Glass	3	HCL
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	P6-SB-07			**Date**	11/1/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.72	**Total Depth (ft-bmp)**	23.61	**Water Column (ft)**	17.89	**Gallons in Well**	2.91
Purge Start	11:55	**Pump Intake (ft-bmp)**	21.61	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:55	**Volumes Purged**	0.91	**Sample ID**	P6-SB-07_110123	**Sampled by**	Donald Richmond
Sample Time	12:50	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	200	5.72	0.53	7.69	0.414	26	1.19	9.7	107	Clear	None
12:10	5	5	200	5.72	0.79	7.63	0.421	23	0.05	12.3	32	Clear	None
12:15	5	10	200	5.72	1.06	7.61	0.4222	22	0	12.7	-29.6	Clear	None
12:20	5	15	200	5.72	1.32	7.59	0.424	23.12	0	12.6	-76	Clear	None
12:25	5	20	200	5.72	1.59	7.57	0.43	22	0	12.7	-88.8	Clear	None
12:30	5	25	200	5.72	1.85	7.54	0.438	20	0	12.9	-99.2	Clear	None
12:35	5	30	200	5.72	2.11	7.52	0.444	13	0	12.9	-101.5	Clear	None
12:40	5	35	200	5.72	2.38	7.51	0.448	13	0	12.7	-103.9	Clear	None
12:45	5	40	200	5.72	2.64	7.49	0.451	10.4	0	12.9	-105.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	P6-SB-18			**Date**	10/31/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	34.0 degrees F and Cloudy. The wind is blowing S/SW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.27	**Total Depth (ft-bmp)**	12.08	**Water Column (ft)**	7.81	**Gallons in Well**	1.27
Purge Start	10:15	**Pump Intake (ft-bmp)**	9.58	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:05	**Volumes Purged**	2.08	**Sample ID**	P6-SB-18_103123	**Sampled by**	Austin Westhuis
Sample Time	11:00	**Gallons Purged**	2.641721	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	200	4.27	0.26	8.78	0.693	940.37	4.27	12	26.8	Clear	None
10:25	5	5	200	4.27	0.53	8.83	0.686	655.42	3.26	11.9	27.2	Clear	None
10:30	5	10	200	4.27	0.79	9.02	0.642	365.27	2.29	12.1	23.6	Clear	None
10:35	5	15	200	4.27	1.06	9.2	0.635	312.93	1	12	18.1	Clear	None
10:40	5	20	200	4.27	1.32	9.21	0.671	288.91	0.88	12.3	16.5	Clear	None
10:45	5	25	200	4.27	1.59	9.22	0.681	271.75	0.77	12.4	15.9	Clear	None
10:50	5	30	200	4.27	1.85	9.26	0.686	218.19	0.61	12.4	14.2	Clear	None
10:55	5	35	200	4.27	2.11	9.27	0.683	210.17	0.58	12.3	10.6	Clear	None
11:00	5	40	200	4.27	2.38	9.28	0.687	201.55	0.56	12.3	7.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-01			**Date**	10/30/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	36.0 degrees F and Cloudy. The wind is blowing NW at 8.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.48	**Total Depth (ft-bmp)**	81.9	**Water Column (ft)**	16.42	**Gallons in Well**	24.01
Purge Start	08:45	**Pump Intake (ft-bmp)**	79.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:45	**Volumes Purged**	0.07	**Sample ID**	PW-14-01_103023	**Sampled by**	Billy Cobern
Sample Time	09:45	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:50	0	0	100	65.59	0.13	5.59	4.151	930.75	0.61	10.8	-39.5	Brown	None
08:55	5	5	100	65.63	0.26	5.56	4.229	1077.48	0.39	11	-31.9	Brown	None
09:00	5	10	100	65.65	0.40	5.55	4.253	1177.96	0.3	11	-26.9	Brown	None
09:05	5	15	100	65.65	0.53	5.54	4.285	1337.58	0.24	11.1	-22.7	Brown	None
09:10	5	20	100	65.65	0.66	5.53	4.301	1672.95	0.21	11.1	-19.1	Brown	None
09:15	5	25	100	65.65	0.79	5.52	4.326	1794.35	0.18	11.2	-16.2	Brown	None
09:20	5	30	100	65.65	0.92	5.5	4.34	2306.47	0.17	11.3	-12.8	Brown	None
09:25	5	35	100	65.65	1.06	5.3	4.397	2271.28	0.64	11.3	36.6	Brown	None
09:30	5	40	100	65.65	1.19	5.27	4.414	1566.48	1.27	11.4	49.7	Brown	None
09:35	5	45	100	65.65	1.32	5.23	4.474	1028.26	0.25	11.3	55.4	Brown	None
09:40	5	50	100	65.65	1.45	5.22	4.468	905.27	0.25	11.3	56.7	Brown	None
09:45	5	55	100	65.65	1.59	5.21	4.468	797.25	0.26	11.3	57.4	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm. Didn't meet stabilization criteria.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-02			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Mostly Clear. The wind is blowing S at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.47	**Total Depth (ft-bmp)**	85.2	**Water Column (ft)**	20.73	**Gallons in Well**	30.32
Purge Start	13:55	**Pump Intake (ft-bmp)**	82.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:30	**Volumes Purged**	0.03	**Sample ID**	PW-14-02_102623	**Sampled by**	Billy Cobern
Sample Time	14:30	**Gallons Purged**	0.9246022	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:00	0	0	100	64.80	0.13	7.54	1.195	45.27	9.84	18.7	182.4	Clear	None
14:05	5	5	100	64.80	0.26	7.06	2.319	21.34	9.21	16.7	189.7	Clear	None
14:10	5	10	100	64.80	0.40	7.05	2.305	22.32	9.1	17.4	187.9	Clear	None
14:15	5	15	100	64.80	0.53	7.05	2.313	24.13	8.92	18	186.3	Clear	None
14:20	5	20	100	64.80	0.66	7.07	2.319	25.06	9.03	18.2	186.3	Clear	None
14:25	5	25	100	64.80	0.79	7.08	2.318	28.02	8.97	18.1	187	Clear	None
14:30	5	30	100	64.80	0.92	7.08	2.317	28.16	8.97	18.1	187.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	PW-14-03R			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	46.9 degrees F and Clear. The wind is blowing S/SW at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	6	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	72.48	**Total Depth (ft-bmp)**	95.5	**Water Column (ft)**	23.02	**Gallons in Well**	33.66
Purge Start	14:50	**Pump Intake (ft-bmp)**	93	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:50	**Volumes Purged**	0.05	**Sample ID**	PW-14-03R_110223	**Sampled by**	Billy Cobern
Sample Time	15:50	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	100	72.73	0.13	5.85	2.882	451.06	10.29	14.1	136.3	Clear	None
15:00	5	5	100	72.75	0.26	5.23	2.967	313.74	5.33	14.4	118.1	Clear	None
15:05	5	10	100	72.75	0.40	5.14	3.026	197.69	4.94	14.5	155.5	Clear	None
15:10	5	15	100	72.75	0.53	5.08	3.089	159.71	4.93	14.6	182.7	Clear	None
15:15	5	20	100	72.75	0.66	5.04	3.149	122.41	5.12	14.6	195.1	Clear	None
15:20	5	25	100	72.75	0.79	4.96	3.208	104.68	5.5	14.5	204.6	Clear	None
15:25	5	30	100	72.75	0.92	4.99	3.251	96.94	6	14.4	210.3	Clear	None
15:30	5	35	100	72.75	1.06	4.96	3.312	92.5	6.55	14.3	218.6	Clear	None
15:35	5	40	100	72.75	1.19	4.95	3.329	91.3	6.88	14.3	220.6	Clear	None
15:40	5	45	100	72.75	1.32	4.93	3.368	93.49	7.15	14.2	224.3	Clear	None
15:45	5	50	100	72.75	1.45	4.91	3.39	96.14	7.34	14.1	228.3	Clear	None
15:50	5	55	100	72.75	1.59	4.89	3.426	100.67	7.59	14.3	231.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Stabilization criteria not met

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Well Locked at Arrival: yes
Condition of Well: Good condition
Well Locked at Departure: yes
Well Completion: Stick-up
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-02			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.9 degrees F and Mostly Clear. The wind is blowing S at 12.8 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.18	**Total Depth (ft-bmp)**	70.5	**Water Column (ft)**	10.32	**Gallons in Well**	1.68
Purge Start	14:55	**Pump Intake (ft-bmp)**	68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	15:35	**Volumes Purged**	0.63	**Sample ID**	TW-14-02_102623	**Sampled by**	Billy Cobern
Sample Time	15:35	**Gallons Purged**	1.056688	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:00	0	0	100	60.20	0.13	7.83	2.246	59.69	9.82	19	192.2	Clear	None
15:05	5	5	100	60.20	0.26	7.69	4.847	17.68	10.99	16.1	199.5	Clear	None
15:10	5	10	100	60.20	0.40	7.67	4.828	23.86	10.78	17.3	201.5	Clear	None
15:15	5	15	100	60.20	0.53	7.67	4.864	15.31	10.66	17.2	202.3	Clear	None
15:20	5	20	100	60.20	0.66	7.64	4.855	13.04	10.57	16.8	203.7	Clear	None
15:25	5	25	100	60.20	0.79	7.61	4.856	6.12	10.51	16.9	204.6	Clear	None
15:30	5	30	100	60.20	0.92	7.6	4.856	6.39	10.5	16.9	204.9	Clear	None
15:35	5	35	100	60.20	1.06	7.61	4.858	6.09	10.48	16.9	204.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Breathing zone during sampling 0ppm.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-14-06			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	61.0 degrees F and Mostly Cloudy. The wind is blowing S at 9.2 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.00	**Total Depth (ft-bmp)**	84.8	**Water Column (ft)**	26.80	**Gallons in Well**	4.35
Purge Start	10:45	**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:40	**Volumes Purged**	0.33	**Sample ID**	TW-14-06_102623	**Sampled by**	Billy Cobern
Sample Time	11:40	**Gallons Purged**	1.452946	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:50	0	0	100	58.00	0.13	7.8	0.454	9.93	11.5	17.1	166.5	Clear	None
10:55	5	5	100	58.00	0.26	7.63	0.392	8.18	12.18	16.9	166.5	Clear	None
11:00	5	10	100	58.00	0.40	7.41	0.29	9.59	13.54	16.2	171.6	Clear	None
11:05	5	15	100	58.00	0.53	7.32	0.261	21.84	12.97	15.9	179	Clear	None
11:10	5	20	100	58.00	0.66	7.31	0.261	31.63	12.3	15.9	180.6	Clear	None
11:15	5	25	100	58.00	0.79	7.3	0.262	38.4	12.21	16	181.5	Clear	None
11:20	5	30	100	58.00	0.92	7.29	0.262	41.3	12.19	16	183	Clear	None
11:25	5	35	100	58.00	1.06	7.28	0.246	58.74	12.07	16	183.7	Clear	None
11:30	5	40	100	58.00	1.19	7.27	0.262	66.74	12.12	16.1	184.2	Clear	None
11:35	5	45	100	58.00	1.32	7.27	0.262	64.78	11.87	16.1	184.5	Clear	None
11:40	5	50	100	58.00	1.45	7.27	0.263	67.99	11.92	16.2	184.6	Clear	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
Phosphorus/TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Cannot accurately determine DTW due to well bubbling. Breathing zone during sampling 0ppm.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-11			**Date**	11/2/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	45.0 degrees F and Cloudy. The wind is blowing S at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.20	**Total Depth (ft-bmp)**	86.9	**Water Column (ft)**	18.70	**Gallons in Well**	3.04
Purge Start	13:35	**Pump Intake (ft-bmp)**	84.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:05	**Volumes Purged**	0.26	**Sample ID**	TW-15-11_110223	**Sampled by**	Billy Cobern
Sample Time	14:05	**Gallons Purged**	0.7925162	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	100	68.50	0.13	7.35	2.267	45.11	11.37	13.4	126.1	Clear	None
13:45	5	5	100	68.50	0.26	7.1	2.722	43.91	12.84	14	136.6	Clear	None
13:50	5	10	100	68.50	0.40	7.06	2.739	46.74	12.93	14.1	144.2	Clear	None
13:55	5	15	100	68.50	0.53	7.05	2.746	46.56	12.7	14.1	151.2	Clear	None
14:00	5	20	100	68.50	0.66	7.06	2.749	47.31	12.67	14	155.3	Clear	None
14:05	5	25	100	68.50	0.79	7.06	2.745	47.12	12.88	14	157.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Water in well is bubbling

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	TW-15-12			**Date**	10/26/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	64.0 degrees F and Mostly Clear. The wind is blowing S/SW at 11.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.09	**Total Depth (ft-bmp)**	76.8	**Water Column (ft)**	13.71	**Gallons in Well**	8.91
Purge Start	12:35	**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	13:00	**Volumes Purged**	0.07	**Sample ID**	TW-15-12_102623	**Sampled by**	Billy Cobern
Sample Time	13:00	**Gallons Purged**	0.6604301	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:40	0	0	100	63.39	0.13	7.34	2.672	158.37	10.81	16.3	203.8	Brown	None
12:45	5	5	100	63.49	0.26	7.28	2.731	135.98	10.79	15.9	204.2	Brown	None
12:50	5	10	100	63.61	0.40	7.3	2.749	126.47	10.65	16.2	205.4	Brown	None
12:55	5	15	100	63.69	0.53	7.31	2.758	122.77	10.54	16.2	206.2	Brown	None
13:00	5	20	100	63.77	0.66	7.31	2.763	122.32	10.49	16.2	206.8	Brown	None

Constituent Sampled	Container	Number	Preservative
Nitrate	125 mL Plastic	1	None
Total Phosphorus/TKN	250 mL Plastic	1	H2SO4
1,4-Dioxane 8270D SIM	40 mL Glass	3	HCL

Comments: Didn't meet drawdown requirements. Breathing zone during sampling 0ppm.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Groundwater Sampling Form

ARCADIS

Project Number	30171056	**Well ID**	UNK-15			**Date**	11/4/2023
Project Name/Location	RACER Lansing 2023 GWS		**Weather(°F)**	48.9 degrees F and Cloudy. The wind is blowing E at 3.4 mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.57	**Total Depth (ft-bmp)**	15.65	**Water Column (ft)**	15.08	**Gallons in Well**	2.45
Purge Start	11:50	**Pump Intake (ft-bmp)**	12.15	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:20	**Volumes Purged**	0.65	**Sample ID**	UNK-15_110423	**Sampled by**	Austin Westhuis
Sample Time	12:15	**Gallons Purged**	1.585032	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:55	0	0	200	0.97	0.26	7.94	0.636	4.17	1.82	14.8	76.6	Clear	None
12:00	5	5	200	1.14	0.53	7.93	0.637	4.01	1.76	14.6	77.8	Clear	None
12:05	5	10	200	1.19	0.79	7.93	0.637	3.81	1.74	14.6	79	Clear	None
12:10	5	15	200	1.26	1.06	7.93	0.637	3.63	1.71	14.7	81.6	Clear	None
12:15	5	20	200	1.29	1.32	7.92	0.638	3.22	1.67	14.8	85.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good condition
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = milliv

Appendix C-2

Soil Vapor Sampling Logs

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Lansing 300 S. Washington Square, Suite 315, Lansing, MI 49426			Project Name: RACER Lansing 2023
Field Manager: Tiffany Linder			Project Number: 30112892
Phone: 810-225-1928	Special Instructions: TO-15		Site Address: Lansing MI
Email Address for Result Reporting: Tiffany.Linder@arcadis.com			Sampler Name: Austin Westhuis / Phone Number:517-719-0214
			Email:Tiffany.Linder@arcadis.com
Helium Detector Used: Fibertec Environmental Services quantitative helium shroud kit	Helium Leak Method: Helium Tracer Test		Summa Canister Size (1L, 2.7 L, 6L): 1 L / Lab: Merit Laboratories

Sample ID	Sample Location Description	Date	Leak/Tracer Test completed prior to sample collection						Canister Number	Flow Controller Number	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Notes
			Shut in Test Pass/Fail?	Purge Reading (ppm)	Shroud Helium Concentration	Helium Test Pass/Fail?	Purge Volume (mL)	Purge Rate (mL/min)							
SVMP-20-01	Plant 6 entrance near off-site park	02/14/2023	N/A	0	65	Pass	200	100	SVMP-20-01(021423)	5005	11:16	-27.5	11:27	-5	Bottle Vac #544 (SVMP-20-01) and Bottle Vac #3635 (Dup-01). Splitter #3814 used for simultaneous sample collection.

Meteorological Data

Date	Time	Temp		Relative Humidity (%)	Barometric Pressure (in.Hg)	Weather source	General Notes or Observations
		Indoor	Outdoor				
02/14/2023	09:53		35	66	30	35.1 degrees F and Clear. The wind is blowing undefined at 5.8 mph.	None

Air Parameters (completed after sample collection)

Location ID	CH4 %	CH4 LEL %	O2 %	PID (ppm)	Differential Pressure (in. Water Column)
SVMP-20-01	0	0	18.9	0	NM

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Lansing 300 S. Washington Square, Suite 315, Lansing, MI 49426			Project Name: RACER Lansing 2023
Field Manager: Tiffany Linder			Project Number: 30171056
Phone: 810-225-1928	Special Instructions: TO-15		Site Address: Lansing MI
Email Address for Result Reporting: Tiffany.Linder@arcadis.com			Sampler Name: Austin Westhuis / Phone Number:517-719-0214
			Email:Tiffany.Linder@arcadis.com
Helium Detector Used: Fibertec Environmental Services quantitative helium shroud kit	Helium Leak Method: Helium Tracer Test		Summa Canister Size (1L, 2.7 L, 6L): 1 L / Lab: Fibertec Environmental Services

Sample ID	Sample Location Description	Date	Leak/Tracer Test completed prior to sample collection						Canister Number	Flow Controller Number	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Notes
			Shut in Test Pass/Fail?	Purge Reading (ppm)	Shroud Helium Concentration	Helium Test Pass/Fail?	Purge Volume (mL)	Purge Rate (mL/min)							
SVMP-20-01_050123	Plant 6 entrance near off-site park	05/01/2023	N/A	0	59	Pass	81.48	100	SVMP-20-01(050123)	10001185	11:27	-28	11:35	-4	Bottle Vac #4094 (SVMP-20-01) and Bottle Vac #0523 (Dup-01). Flow controller #10001185 used with splitter #10003809 for simultaneous sample collection.

Meteorological Data

Date	Time	Temp		Relative Humidity (%)	Barometric Pressure (in.Hg)	Weather source	**General Notes or Observations**
		Indoor	Outdoor				
05/01/2023	09:53		42	76	29	42.1 degrees F and Cloudy. The wind is blowing undefined at 13.9 mph.	None

Air Parameters (completed after sample collection)

Location ID	CH4 %	CH4 LEL %	O2 %	PID (ppm)	Differential Pressure (in. Water Column)
SVMP-20-01_050123	0	0	17.6	0	NM

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Lansing 300 S. Washington Square, Suite 315, Lansing, MI 49426			Project Name: RACER Lansing 2023 Q3
Field Manager: Tiffany Linder			Project Number: 30171056
Phone: 810-225-1928	Special Instructions: TO-15		Site Address: Lansing MI
Email Address for Result Reporting: Tiffany.Linder@arcadis.com			Sampler Name: Austin Westhuis / Phone Number: 517-719-0214
			Email: Tiffany.Linder@arcadis.com
Helium Detector Used: Fibertec Environmental Services quantitative helium shroud kit	Helium Leak Method: Helium Tracer Test		Summa Canister Size (1L, 2.7 L, 6L): 1 L / Lab: Fibertec Environmental Services

Sample ID	Sample Location Description	Date	Leak/Tracer Test completed prior to sample collection						Canister Number	Flow Controller Number	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Notes
			Shut in Test Pass/Fail?	Purge Reading (ppm)	Shroud Helium Concentration	Helium Test Pass/Fail?	Purge Volume (mL)	Purge Rate (mL/min)							
SVMP-20-01_082923	Plant 6 entrance near off-site park	08/29/2023	N/A	0	60.4	Pass	81.48	100	SVMP-20-01(082923)	10001185	09:30	-26	09:39	-5	Bottle Vac #4228 (SVMP-20-01) and Bottle Vac #0473 (Dup-01). Flow controller #10003405 used with splitter #10003808 for simultaneous sample collection.

Meteorological Data

Date	Time	Temp		Relative Humidity (%)	Barometric Pressure (in.Hg)	Weather source	**General Notes or Observations**
		Indoor	Outdoor				
08/29/2023	08:53		63	75	30	63.0 degrees F and Clear. The wind is blowing undefined at 3.4 mph.	None

Air Parameters (completed after sample collection)

Location ID	CH4 %	CH4 LEL %	O2 %	PID (ppm)	Differential Pressure (in. Water Column)
SVMP-20-01_082923	0	0	15.6	0	NM

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Lansing 300 S. Washington Square, Suite 315, Lansing, MI 49426			Project Name: RACER Lansing 2023 Q4
Field Manager: Tiffany Linder			Project Number: 30171056
Phone: 810-225-1928	Special Instructions: TO-15		Site Address: Lansing MI
Email Address for Result Reporting: Tiffany.Linder@arcadis.com			Sampler Name: Austin Westhuis / Phone Number: 517-719-0214
			Email: Tiffany.Linder@arcadis.com
Helium Detector Used: Fibertec Environmental Services quantitative helium shroud kit	Helium Leak Method: Helium Tracer Test		Summa Canister Size (1L, 2.7 L, 6L): 1 L / Lab: Fibertec Environmental Services

Sample ID	Sample Location Description	Date	Leak/Tracer Test completed prior to sample collection						Canister Number	Flow Controller Number	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Notes
			Shut in Test Pass/Fail?	Purge Reading (ppm)	Shroud Helium Concentration	Helium Test Pass/Fail?	Purge Volume (mL)	Purge Rate (mL/min)							
SVMP-20-01_102723	Plant 6 entrance near off-site park	10/27/2023	N/A	0	44.9	Pass	81.48	100	3554	3383	13:15	-26	13:25	-5	Bottle Vac #3554 (SVMP-20-01) and Bottle Vac #4097 (Dup-01). Flow controller #3383 used with splitter #3837 for simultaneous sample collection.

Meteorological Data

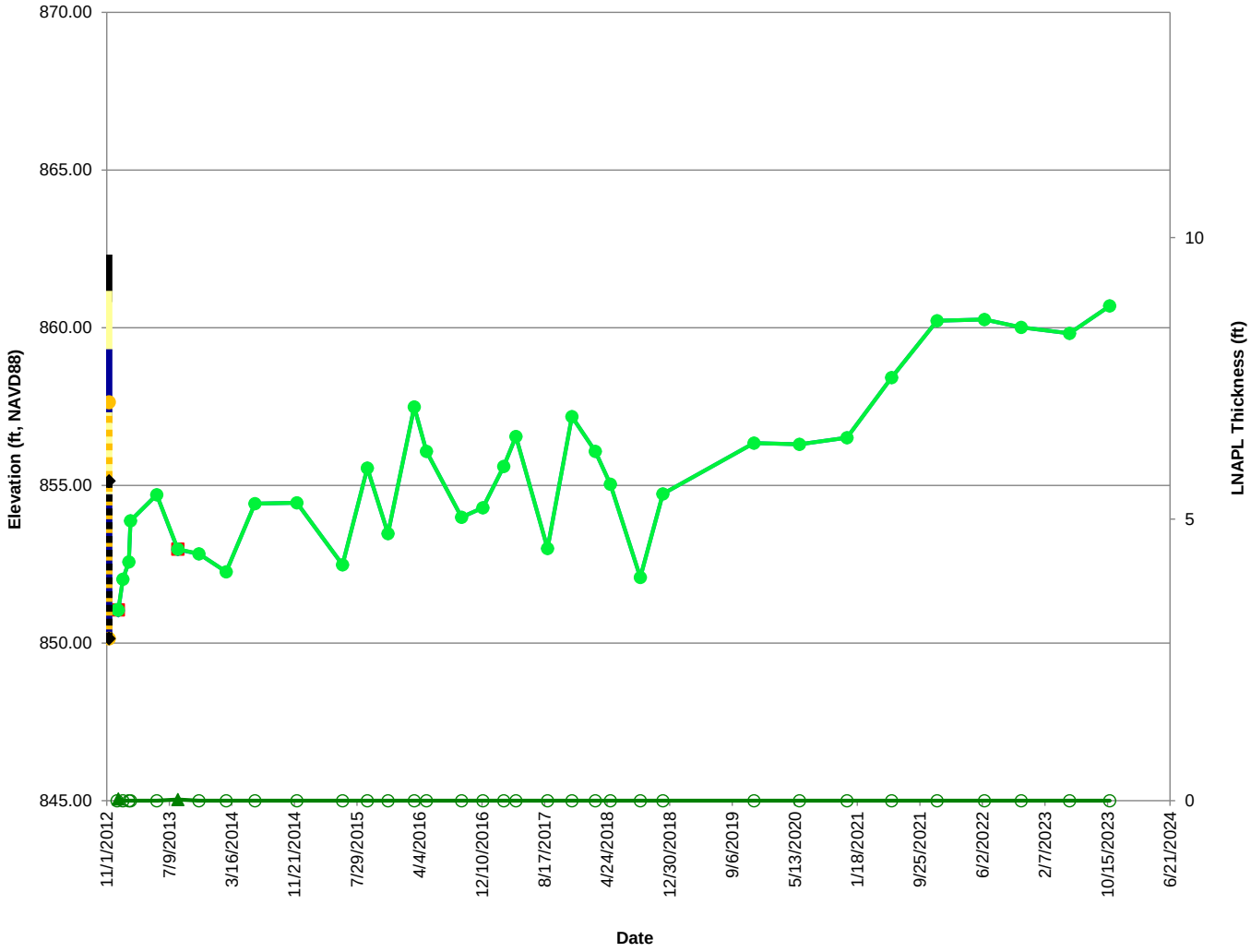
Date	Time	Temp		Relative Humidity (%)	Barometric Pressure (in.Hg)	Weather source	**General Notes or Observations**
		Indoor	Outdoor				
10/27/2023	10:53		66	84	30	66.0 degrees F and Cloudy. The wind is blowing undefined at 12.8 mph.	None

Air Parameters (completed after sample collection)

Location ID	CH4 %	CH4 LEL %	O2 %	PID (ppm)	Differential Pressure (in. Water Column)
SVMP-20-01_102723	0	0	15.9	0	NM

Appendix D

LNAPL Trend Graphs



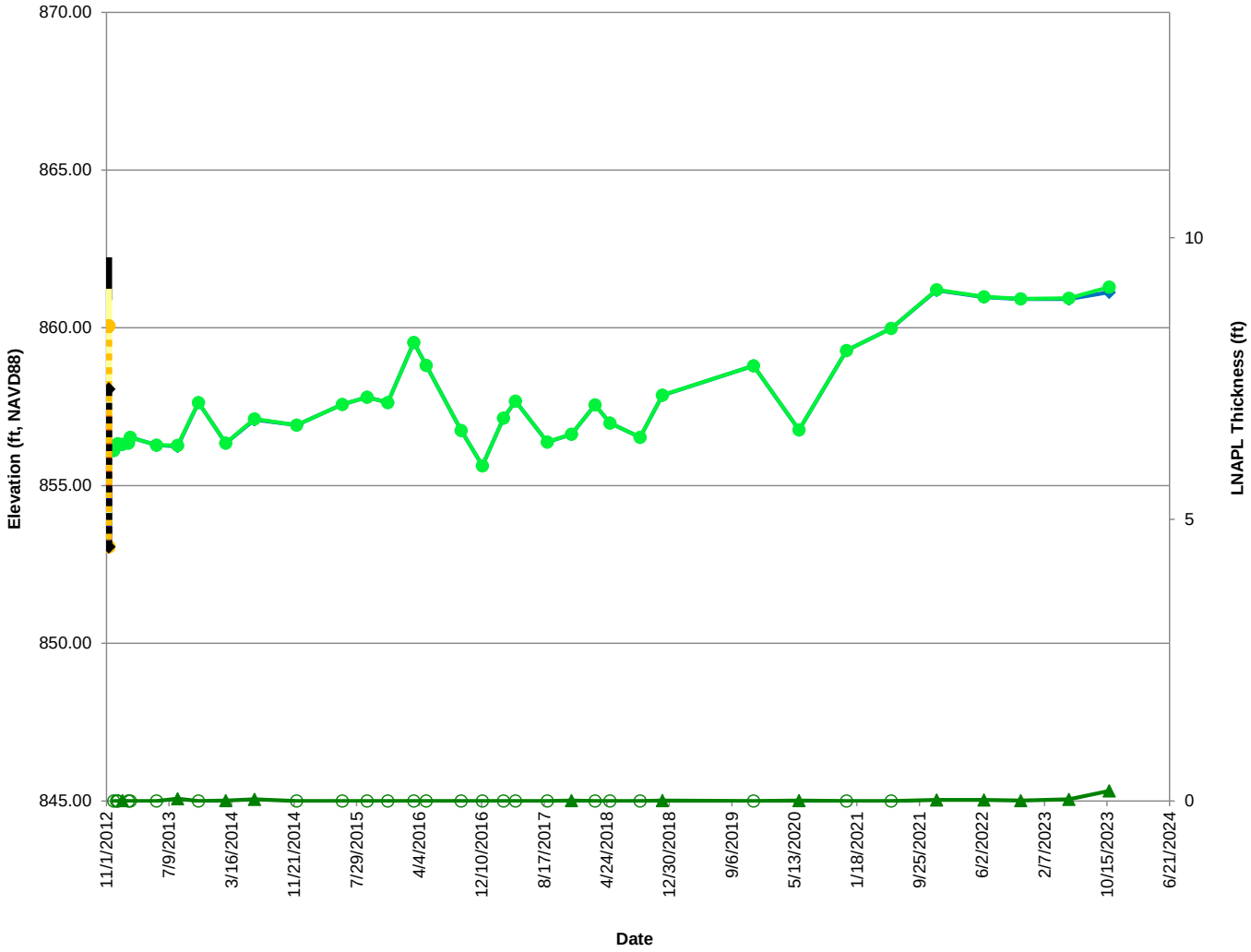
RACER Lansing
Lansing, MI

LMW-12-01 LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



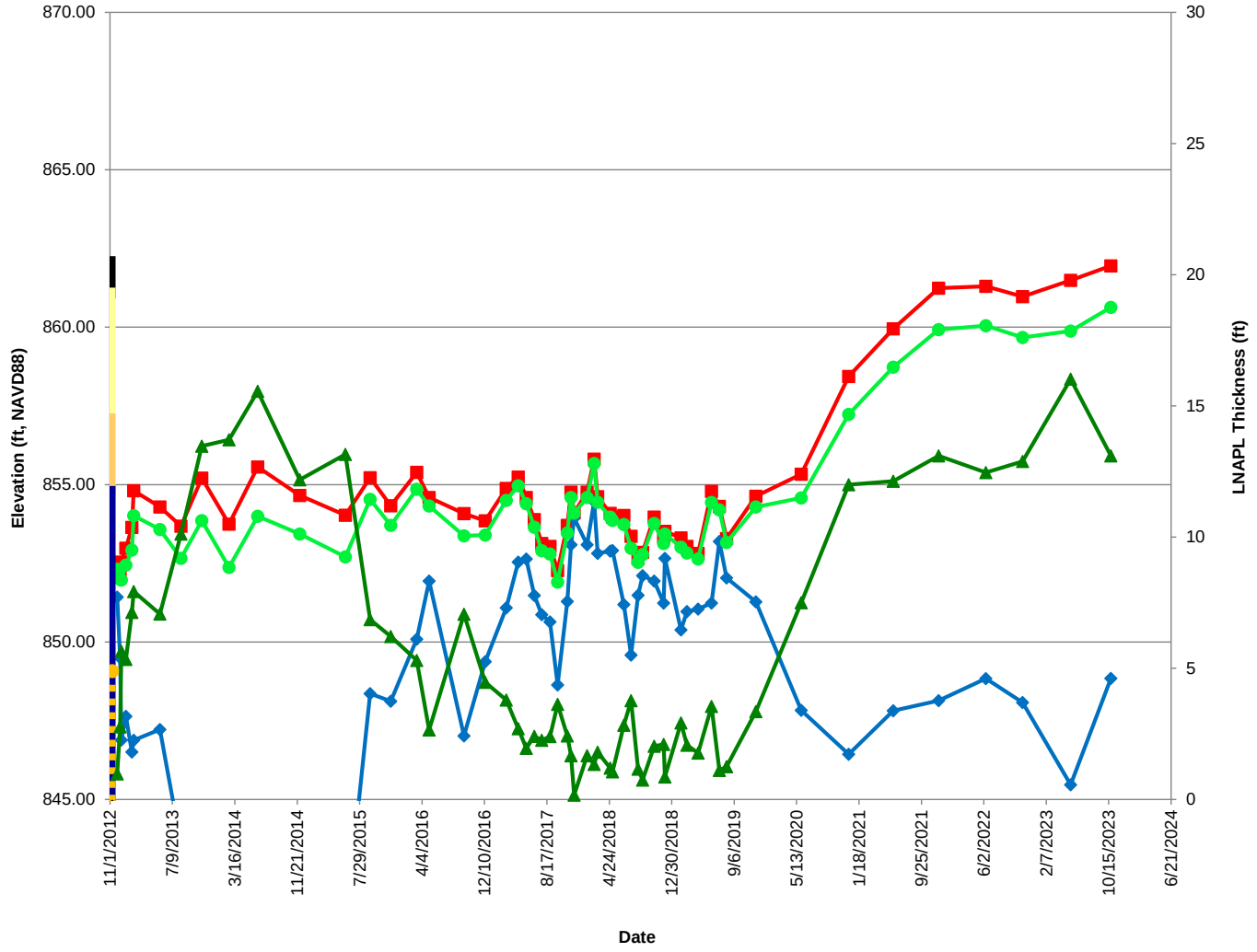
RACER Lansing
Lansing, MI

LMW-12-03S LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



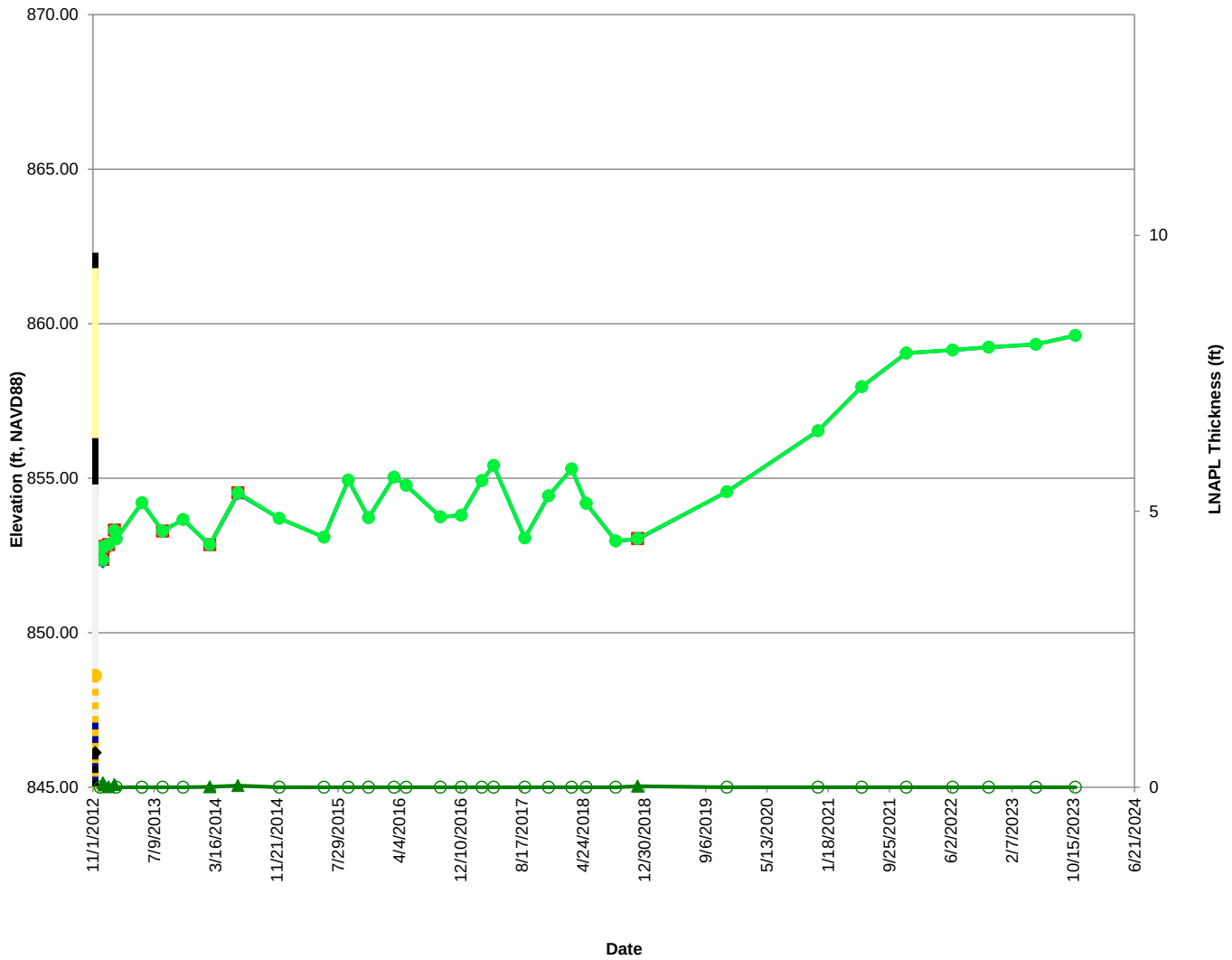
RACER Lansing
Lansing, MI

LMW-12-03D LNAPL HYDROGRAPH

ARCADIS

FIGURE

A

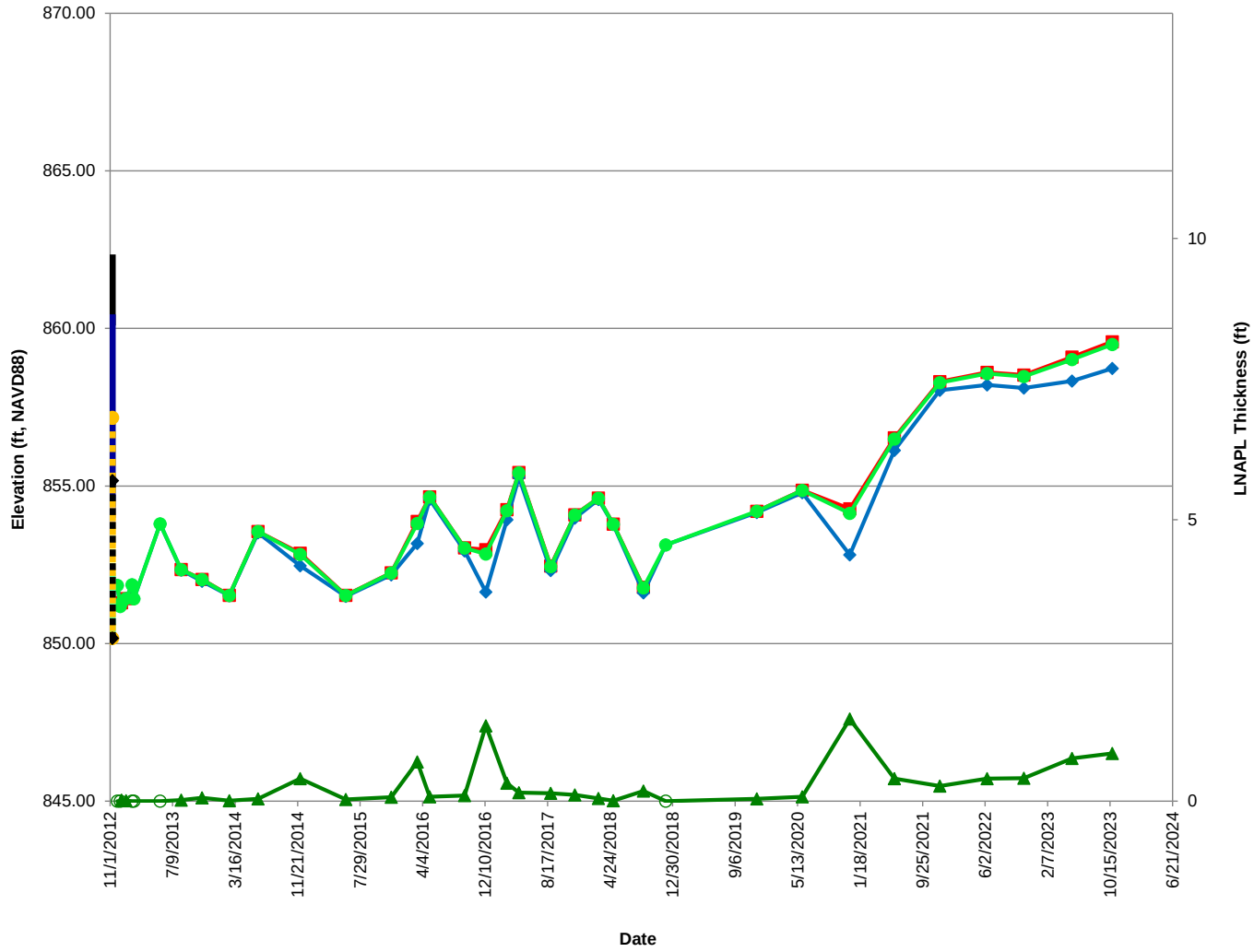


RACER Lansing
Lansing, MI

LMW-12-04 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Clay
Coarse Sand
Medium Sand
Silty Sand
Filter Pack
Screened Interval
NAPL Thickness

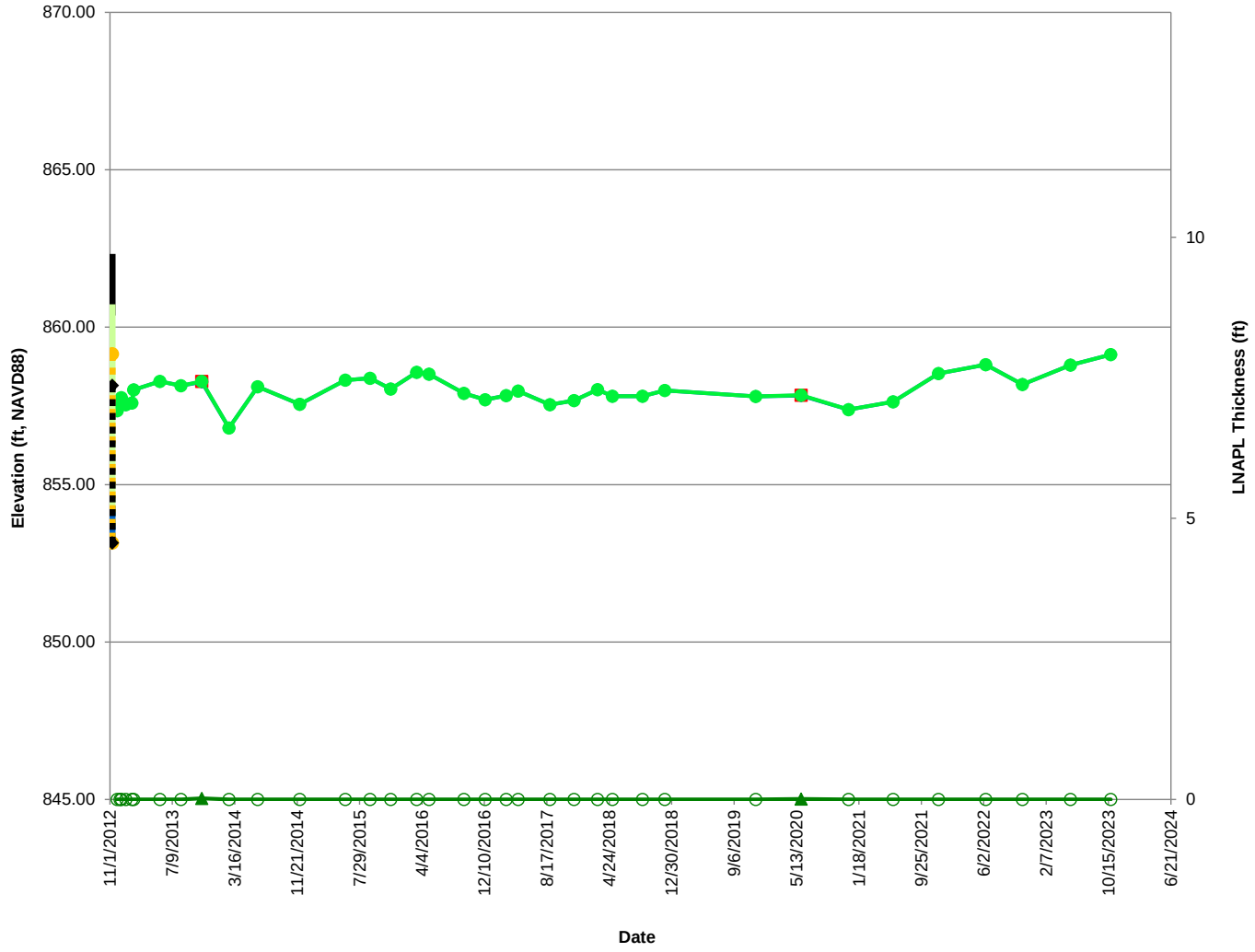
RACER Lansing
Lansing, MI

LMW-12-05 LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



Air-NAPL Interface

NAPL-Water or Air-Water Interface

Potentiometric Surface

Concrete

Fine Sand

Silty Clay

Filter Pack

Screened Interval

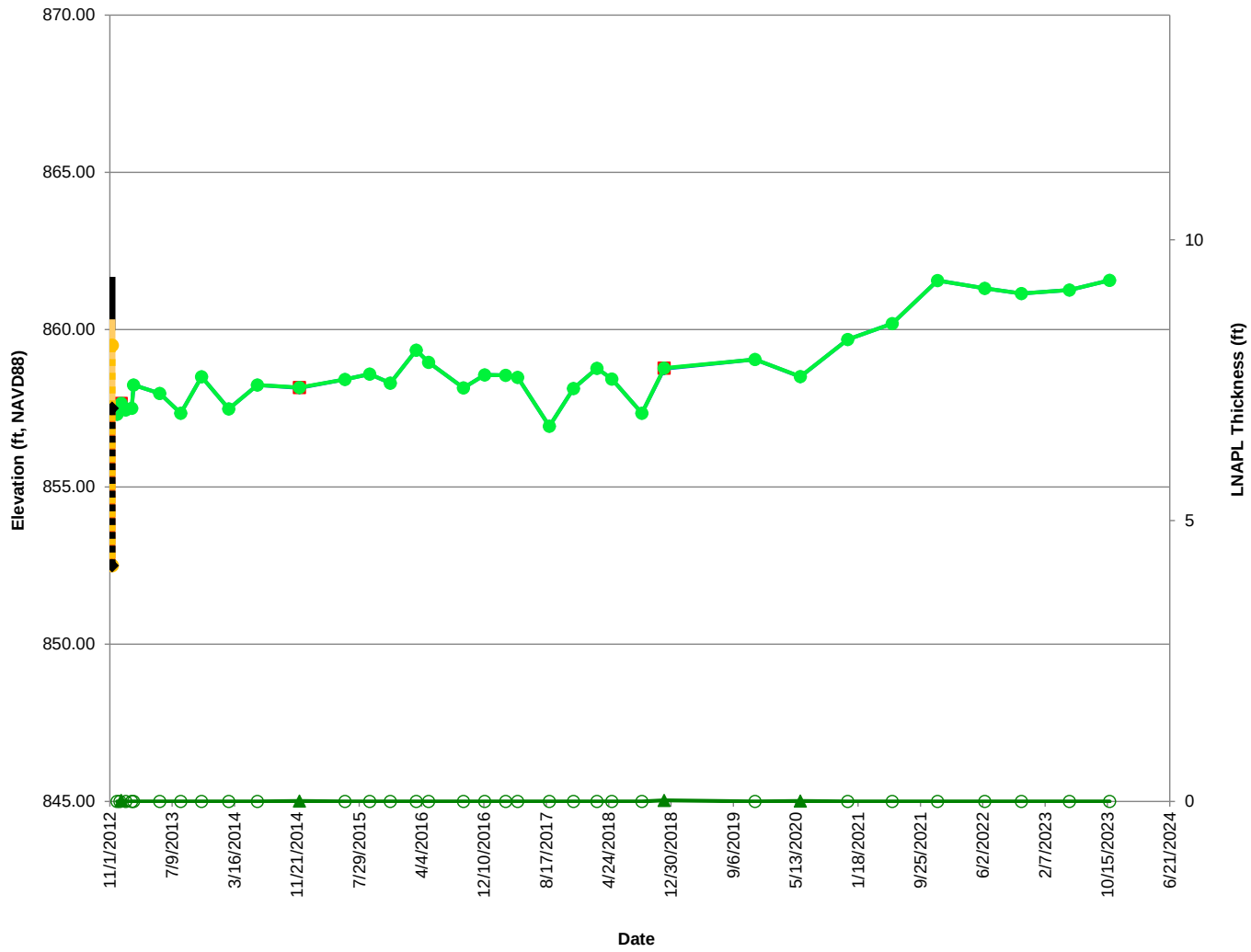
NAPL Thickness

RACER Lansing
Lansing, MI

LMW-12-06 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Coarse Sand
Sand and Gravel
Filter Pack
Screened Interval
NAPL Thickness

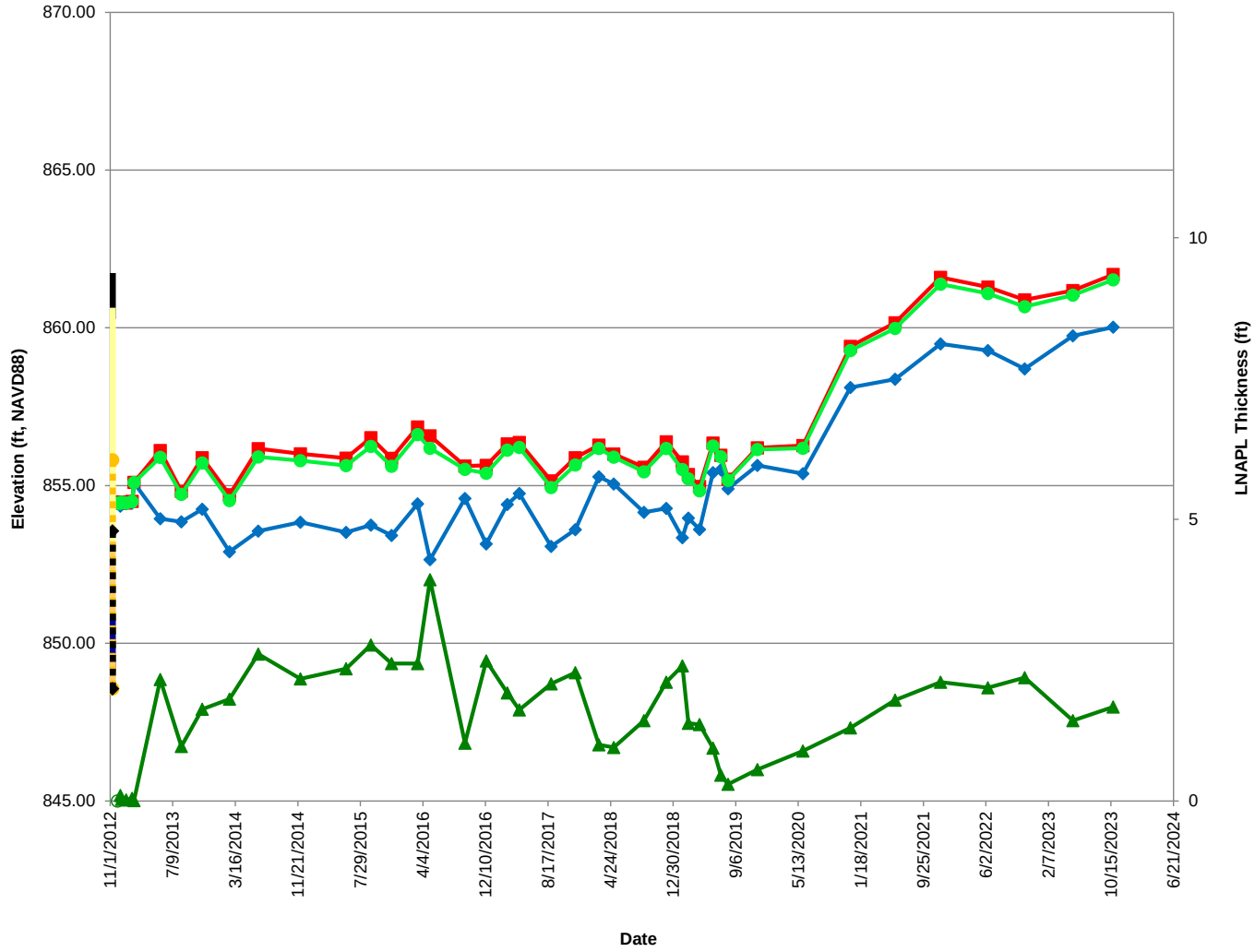
RACER Lansing
Lansing, MI

LMW-12-07 LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



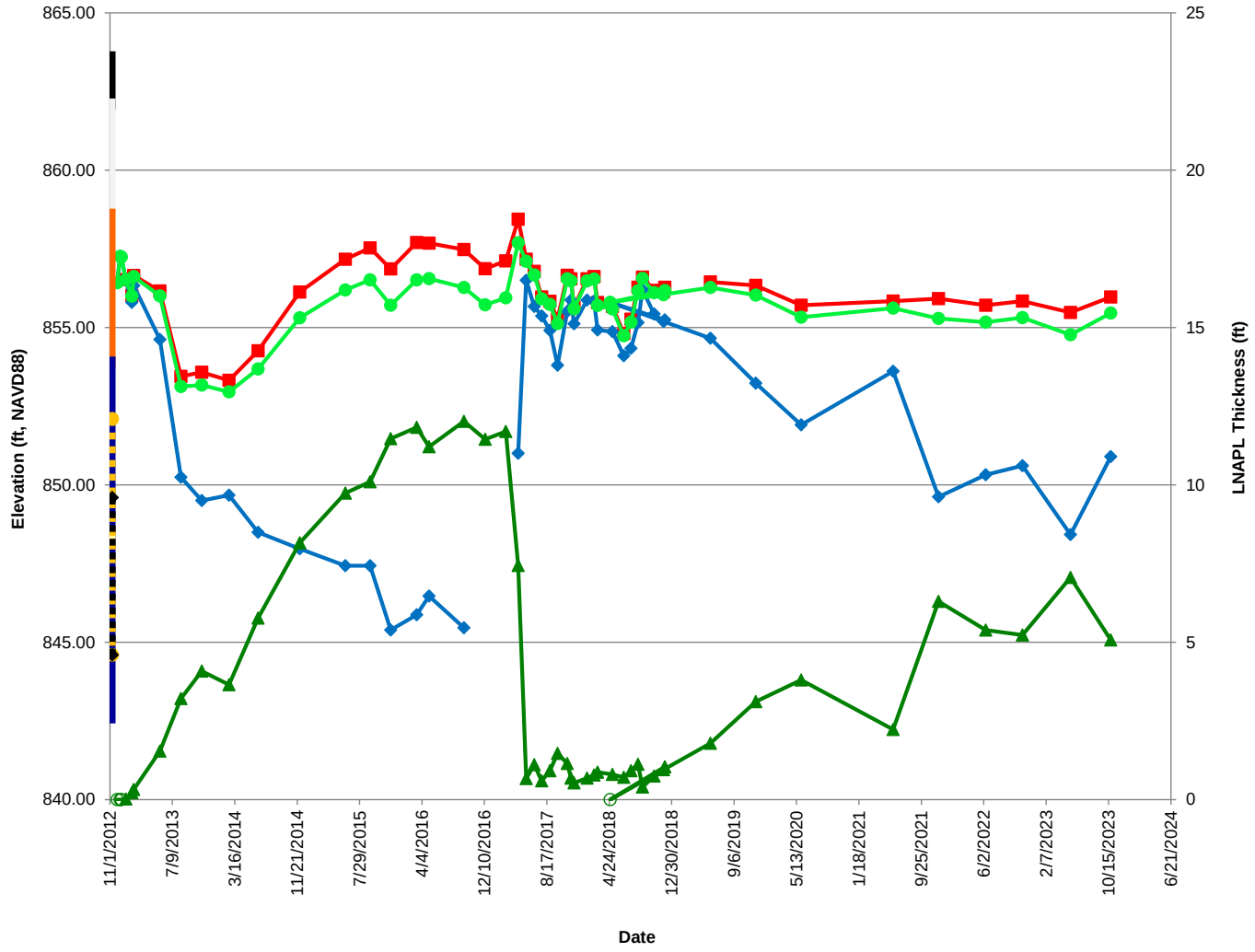
RACER Lansing
Lansing, MI

LMW-12-08 LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



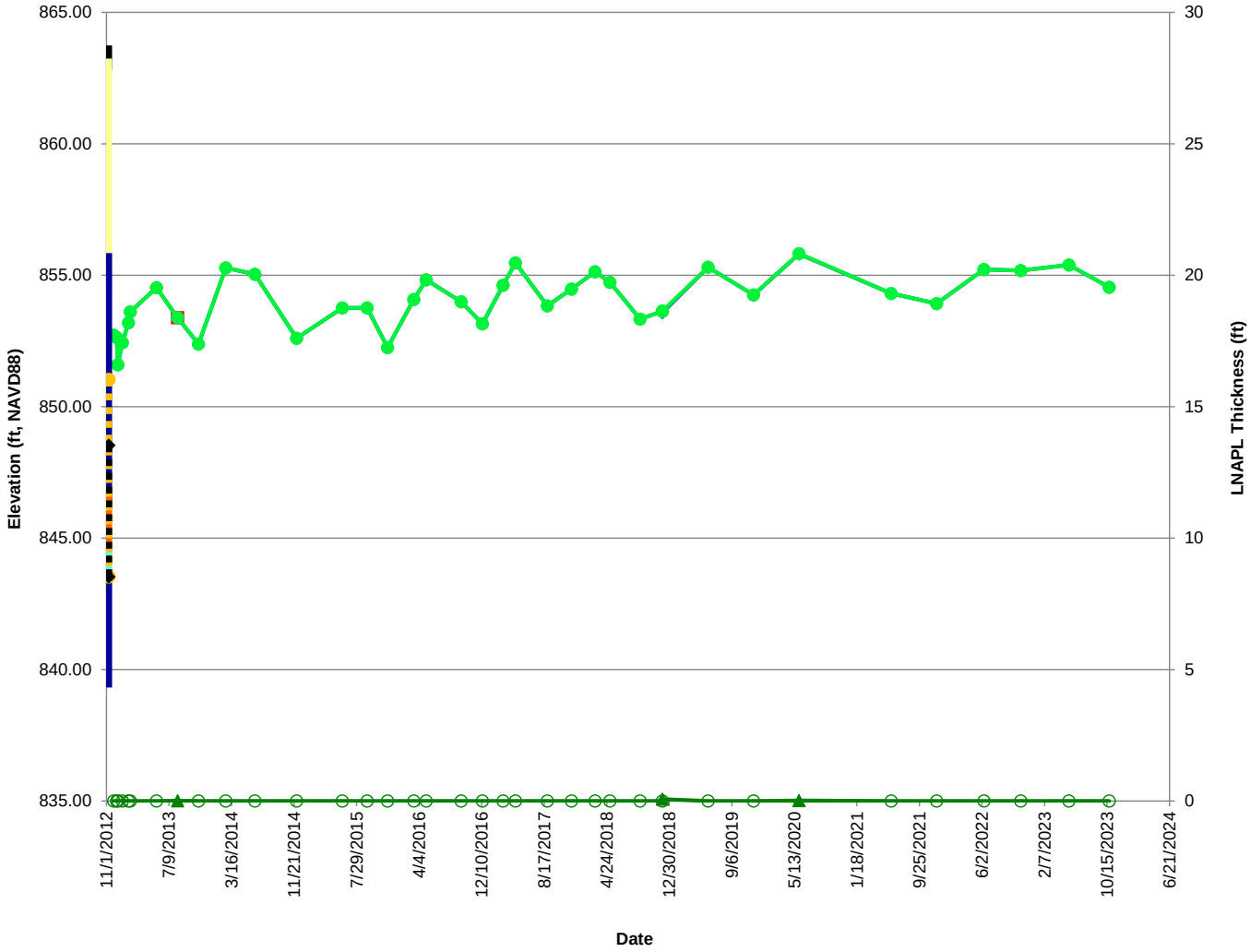
RACER Lansing
Lansing, MI

LMW-12-10 LNAPL HYDROGRAPH

ARCADIS

FIGURE

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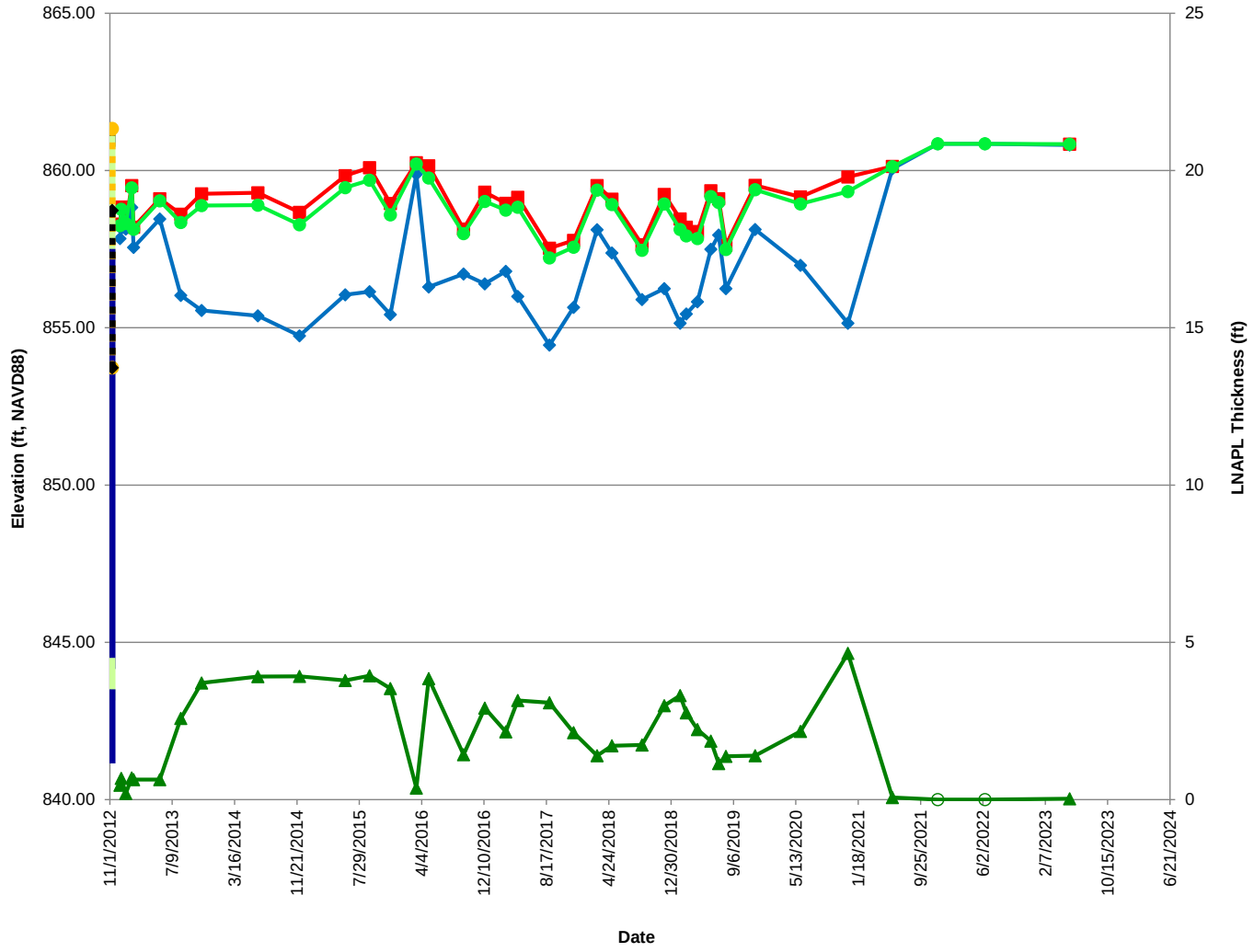


RACER Lansing
Lansing, MI

LMW-12-11 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A

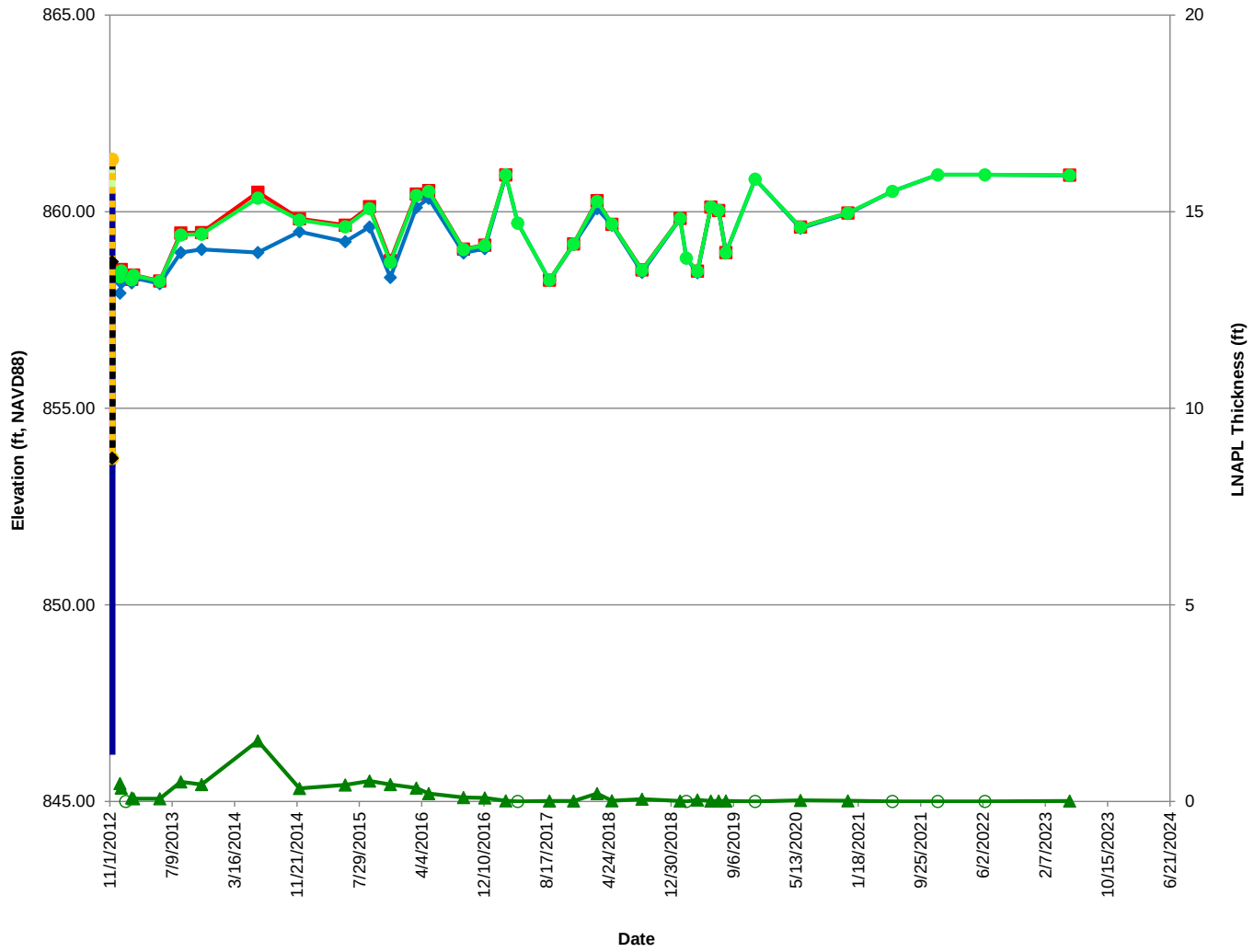


RACER Lansing
Lansing, MI

PMW-01 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



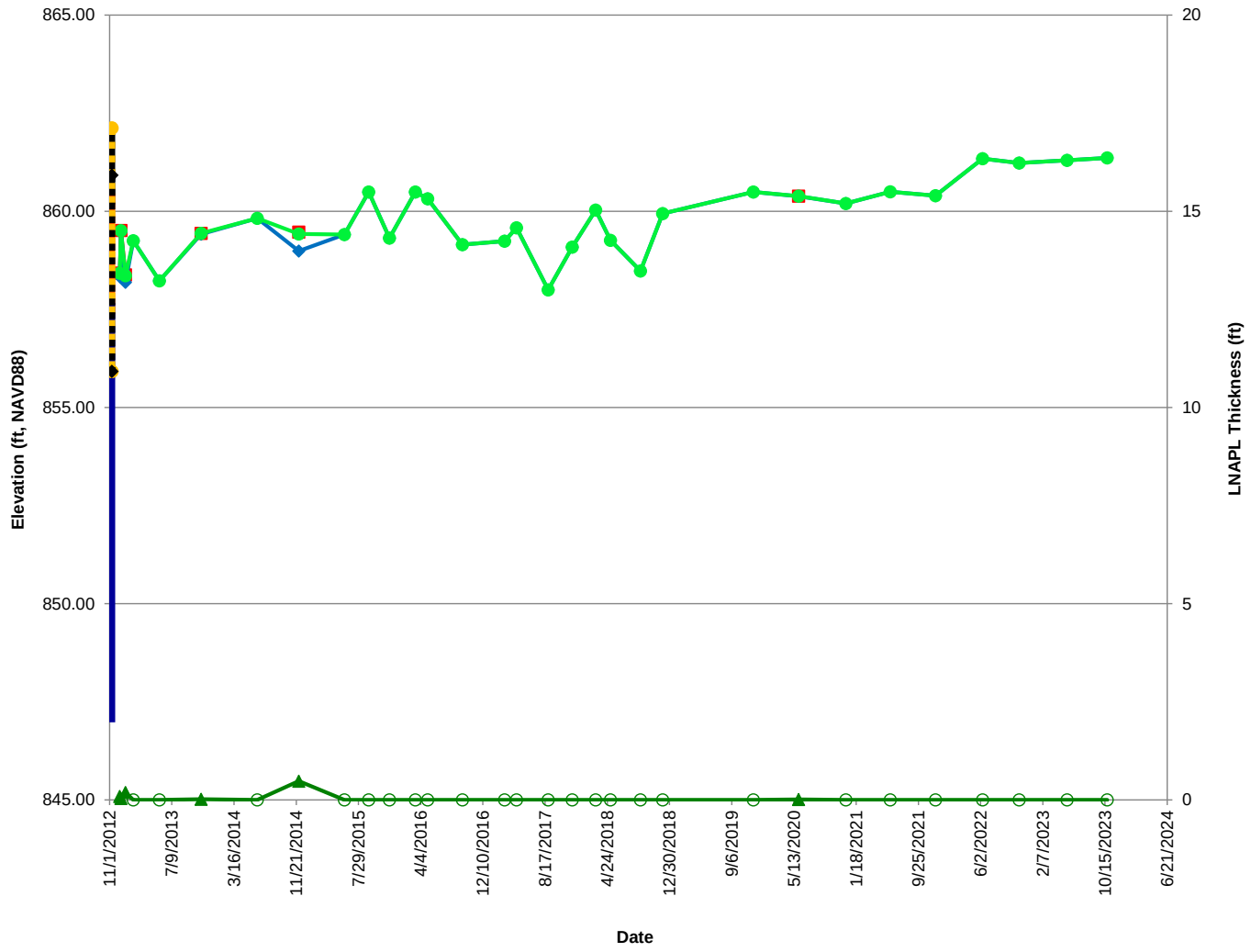
RACER Lansing
Lansing, MI

PMW-02 LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



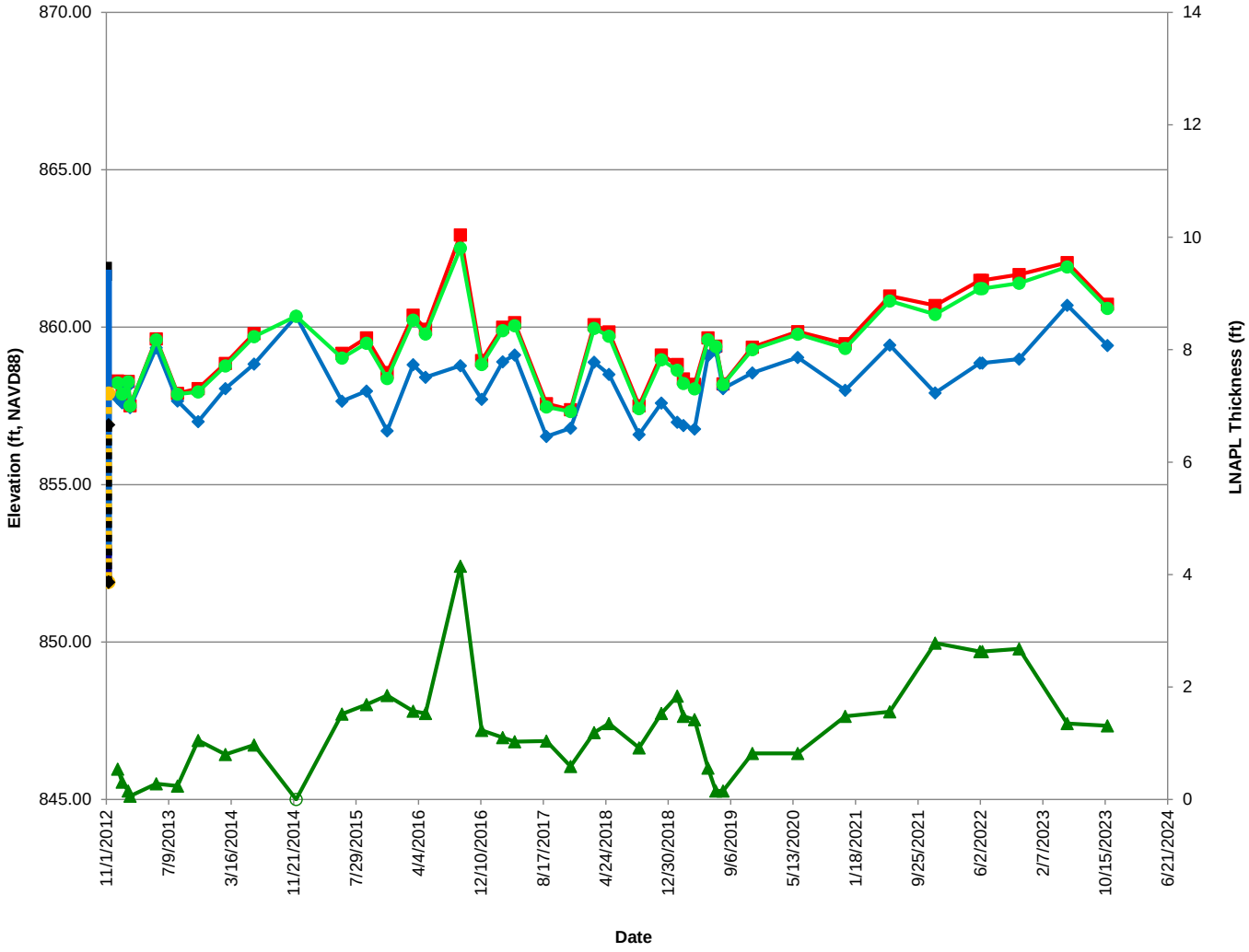
Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Sand and Gravel
Clay
Filter Pack
Screened Interval
NAPL Thickness

RACER Lansing
Lansing, MI

PMW-03 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A

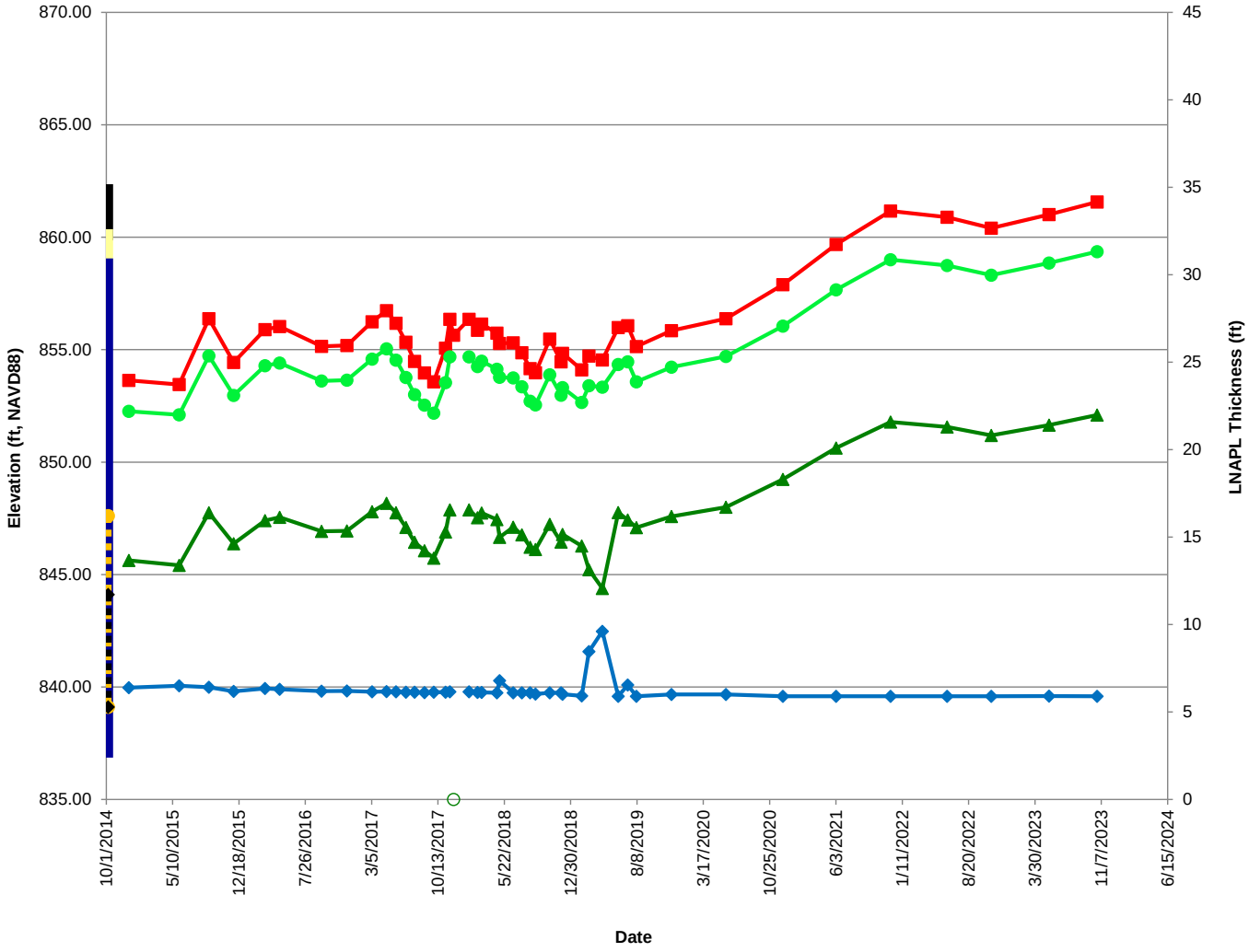


RACER Lansing
Lansing, MI

P2-SB-37 LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



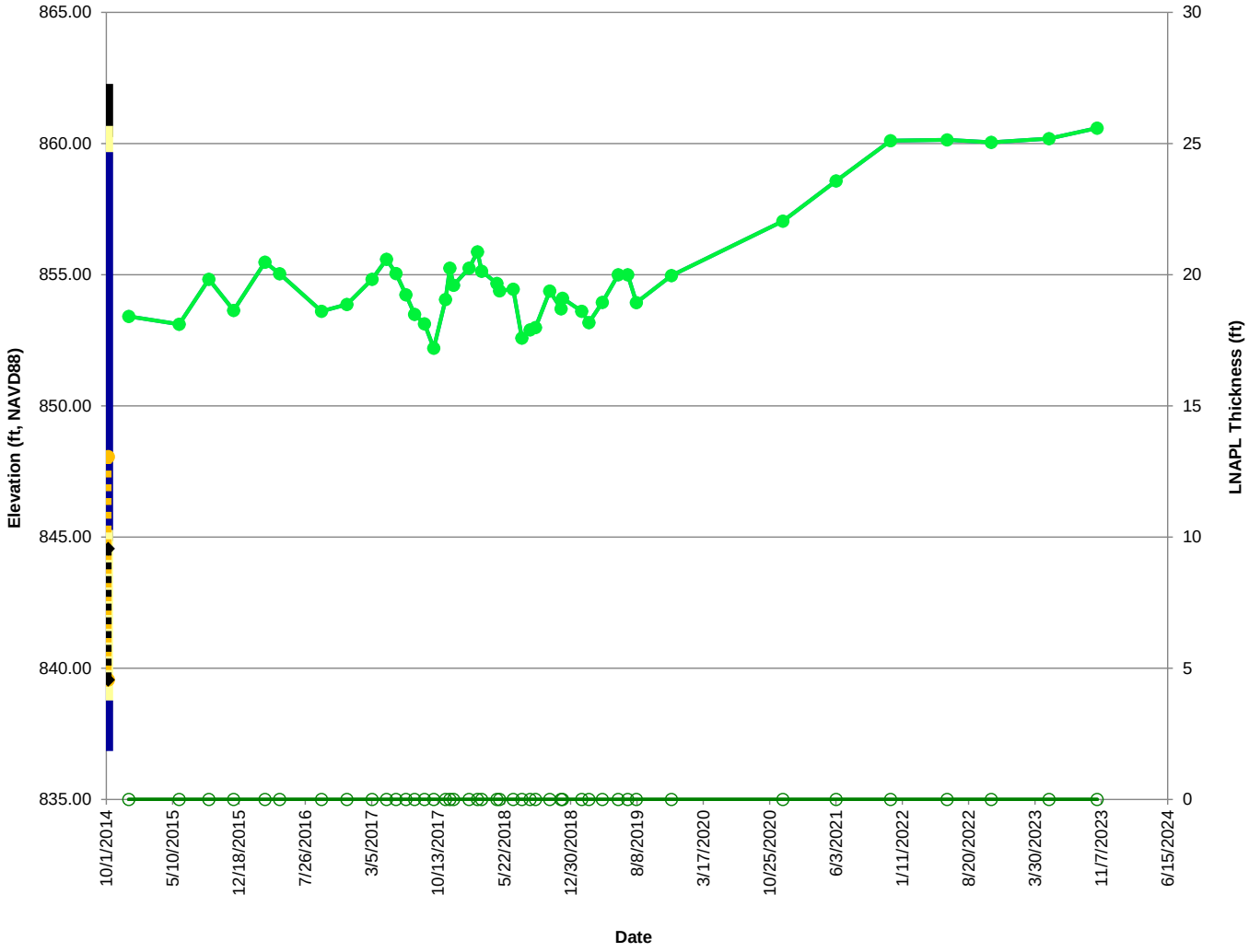
Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Medium Sand
Clay
Filter Pack
Screened Interval
NAPL Thickness

RACER Lansing
Lansing, MI

LMW-14-12D LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



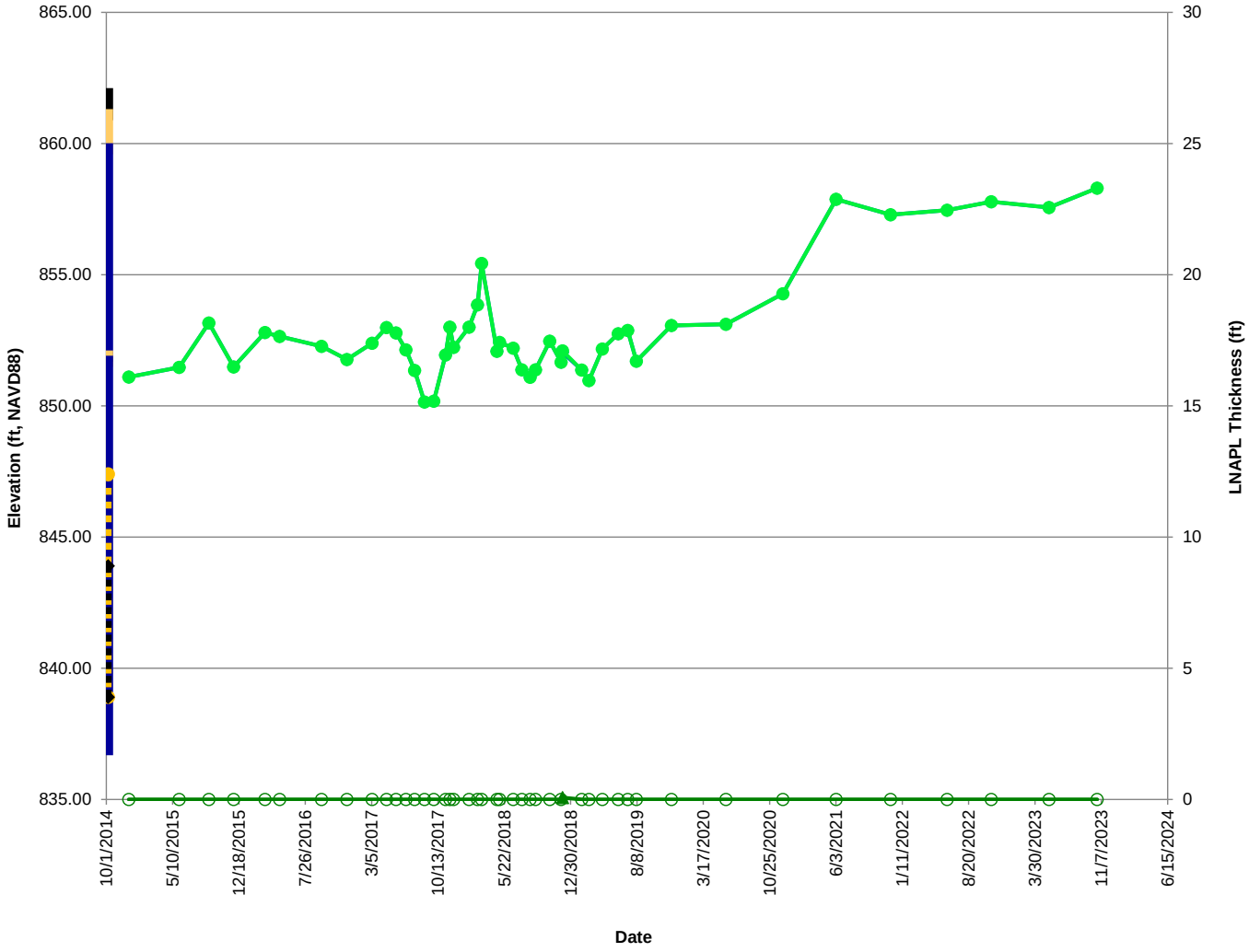
Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Medium Sand
Clay
Filter Pack
Screened Interval
NAPL Thickness

RACER Lansing
Lansing, MI

LMW-14-13D LNAPL HYDROGRAPH

ARCADIS

FIGURE
A

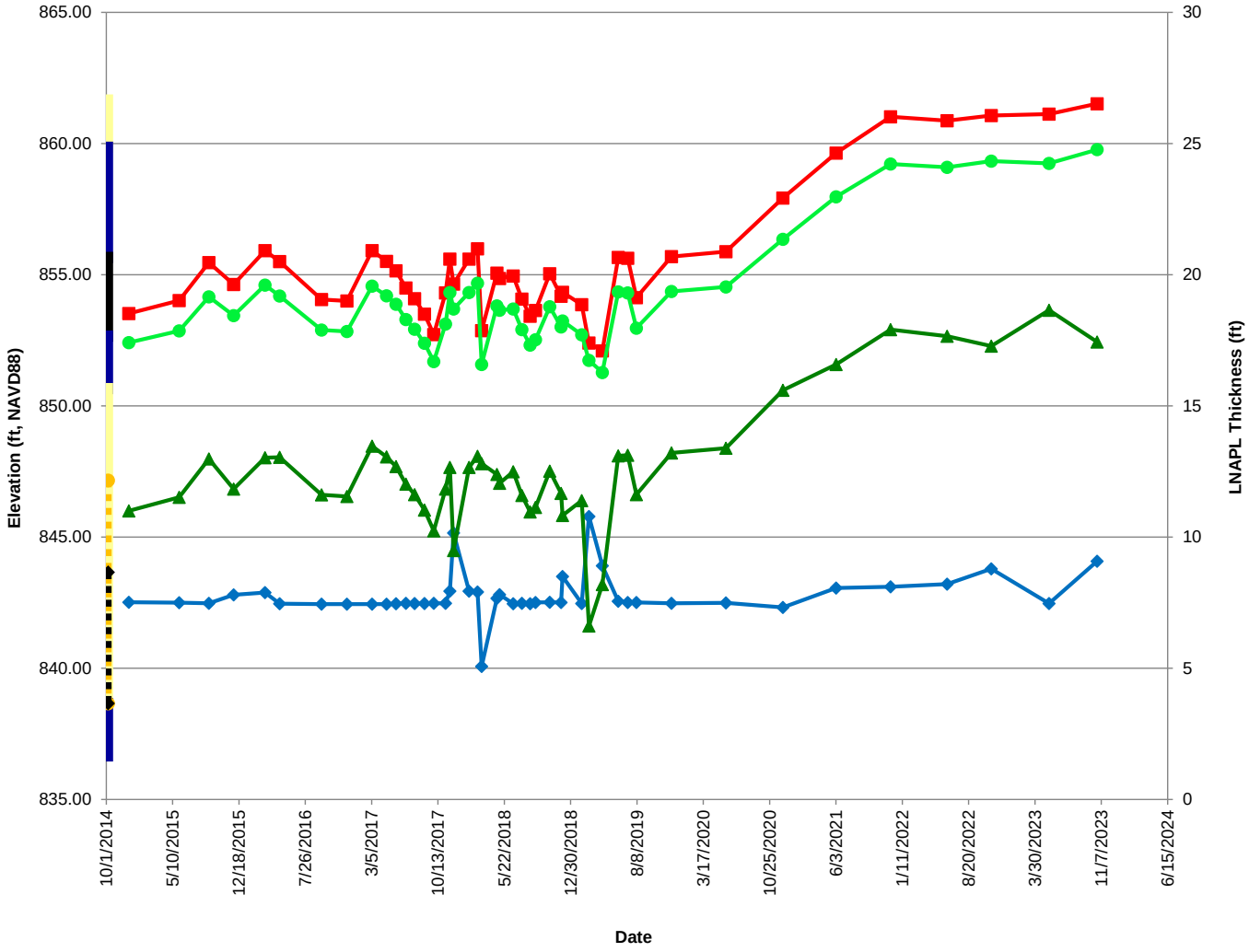


RACER Lansing
Lansing, MI

LMW-14-14D LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



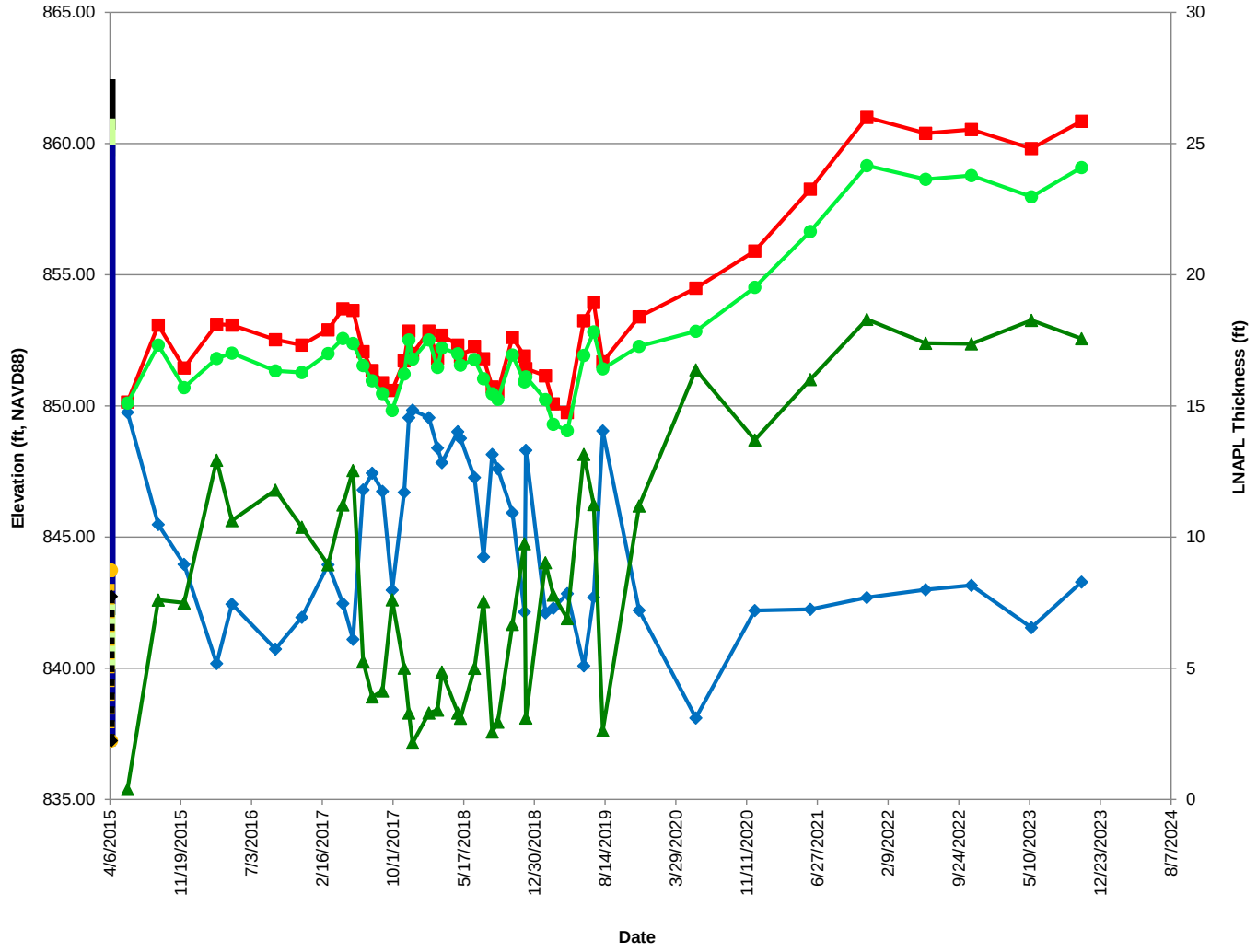
RACER Lansing
Lansing, MI

LMW-14-15D LNAPL HYDROGRAPH

ARCADIS

FIGURE

A



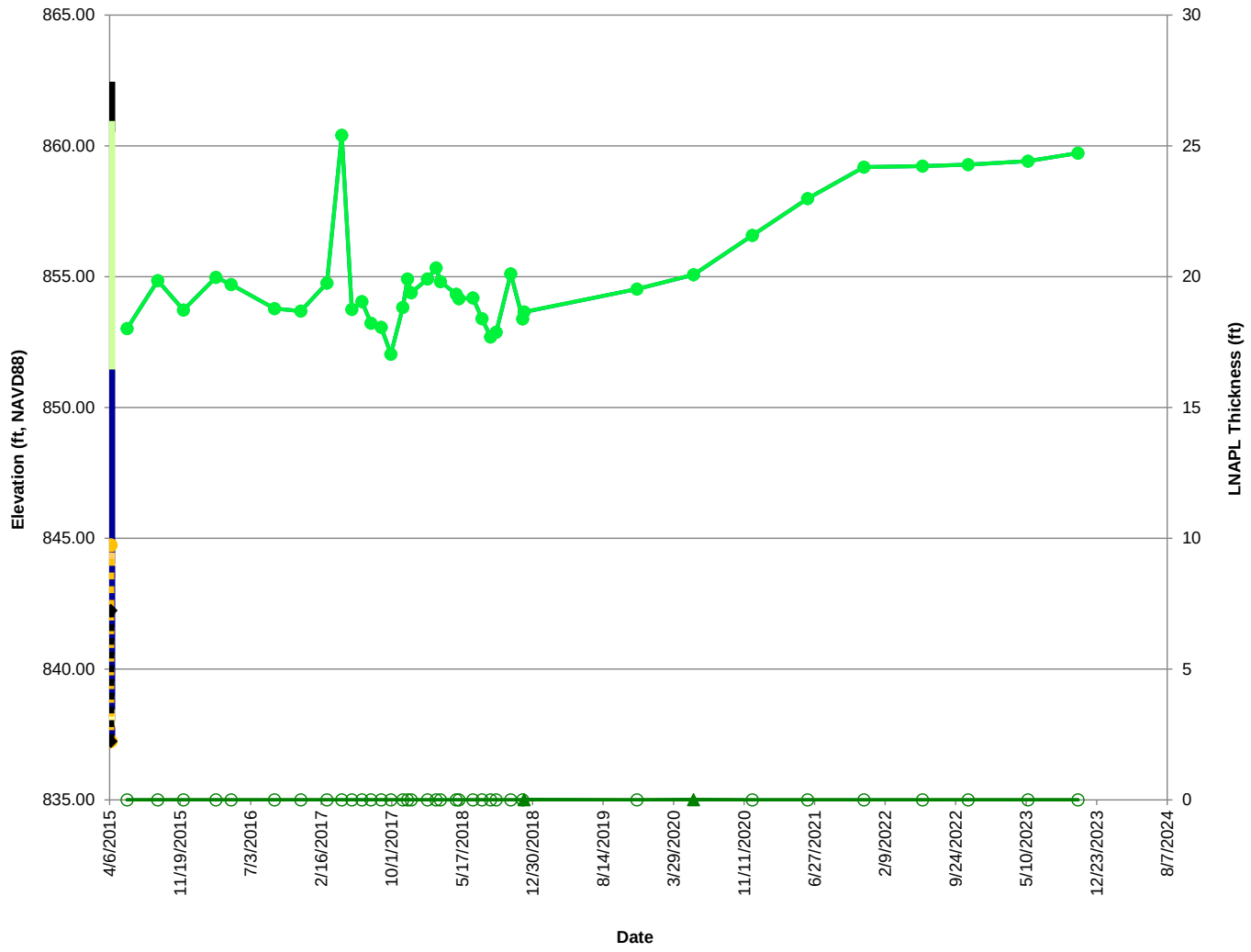
Air-NAPL Interface
NAPL-Water or Air-Water Interface
Potentiometric Surface
Concrete
Fine Sand
Clay
Filter Pack
Screened Interval
NAPL Thickness

RACER Lansing
Lansing, MI

LMW-15-16D LNAPL HYDROGRAPH

ARCADIS

FIGURE
A



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Lansing, MI

LMW-15-17D LNAPL HYDROGRAPH

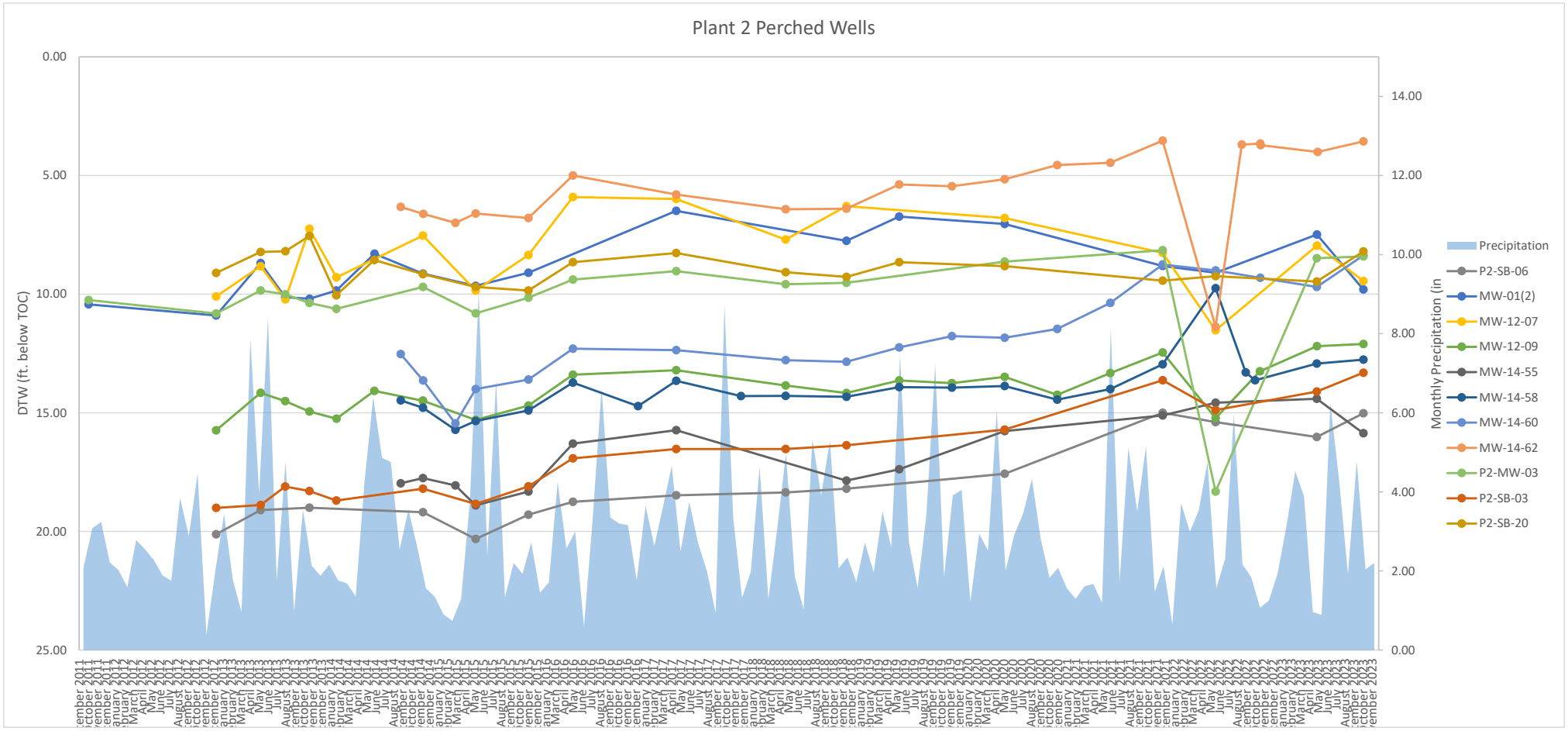
ARCADIS

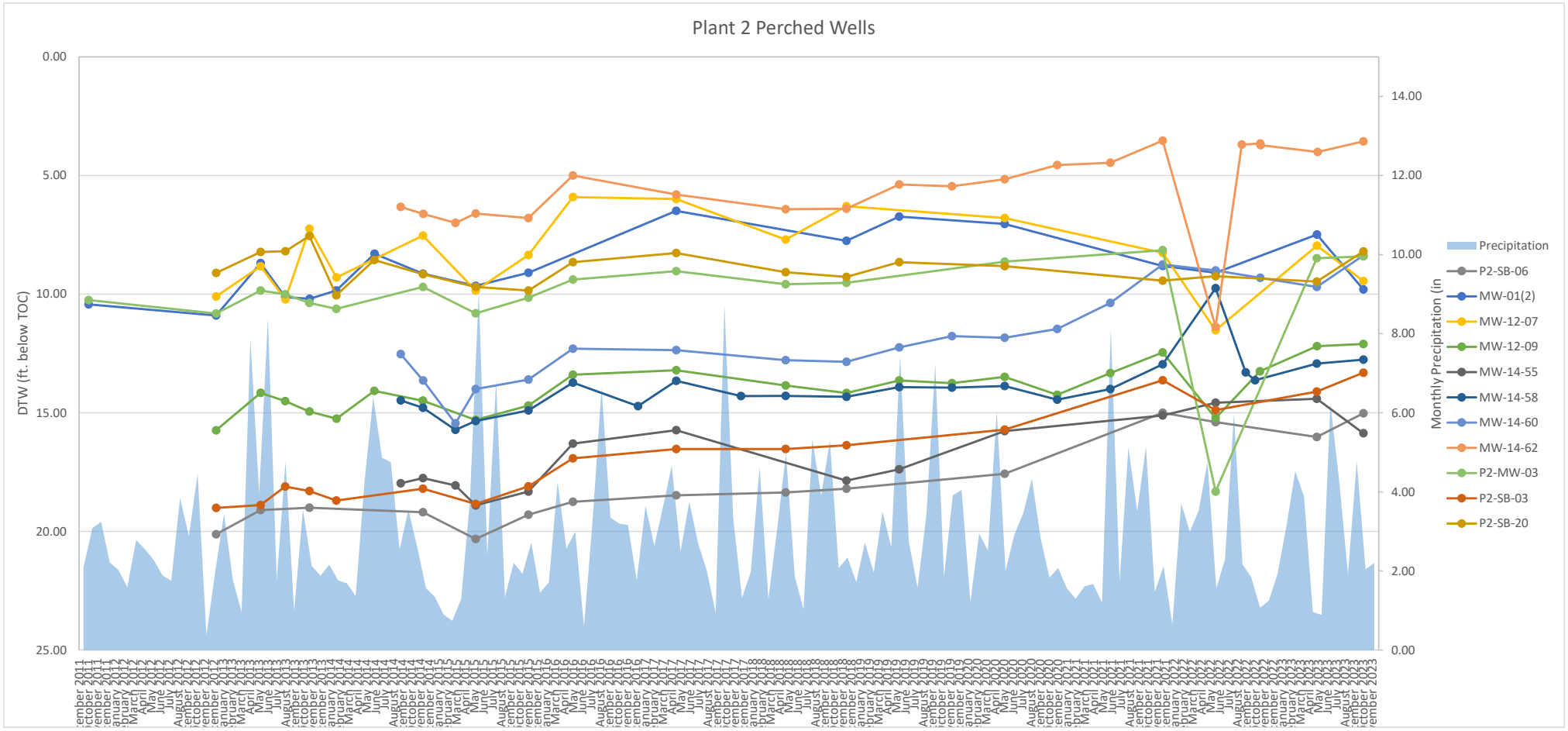
FIGURE

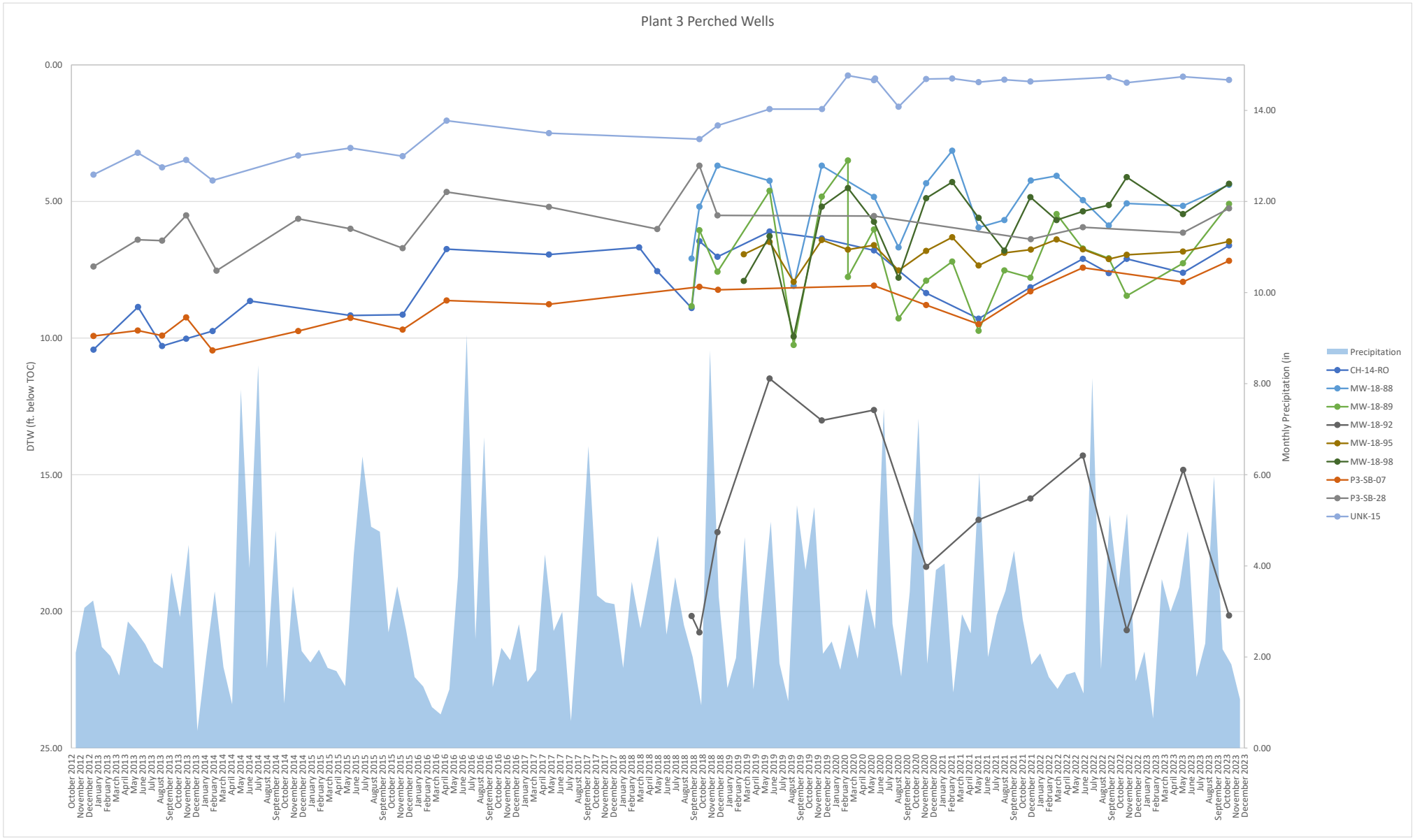
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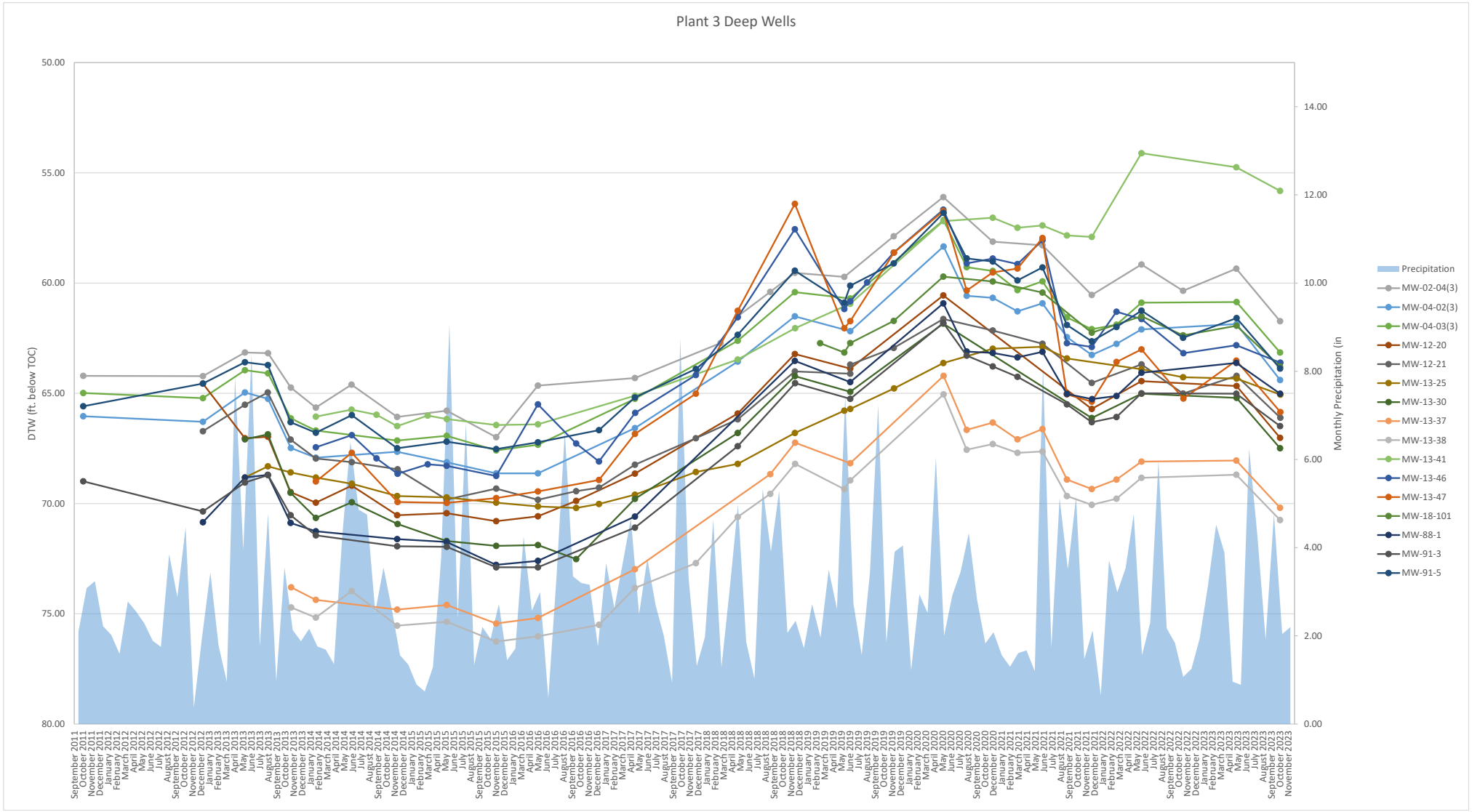
Appendix E

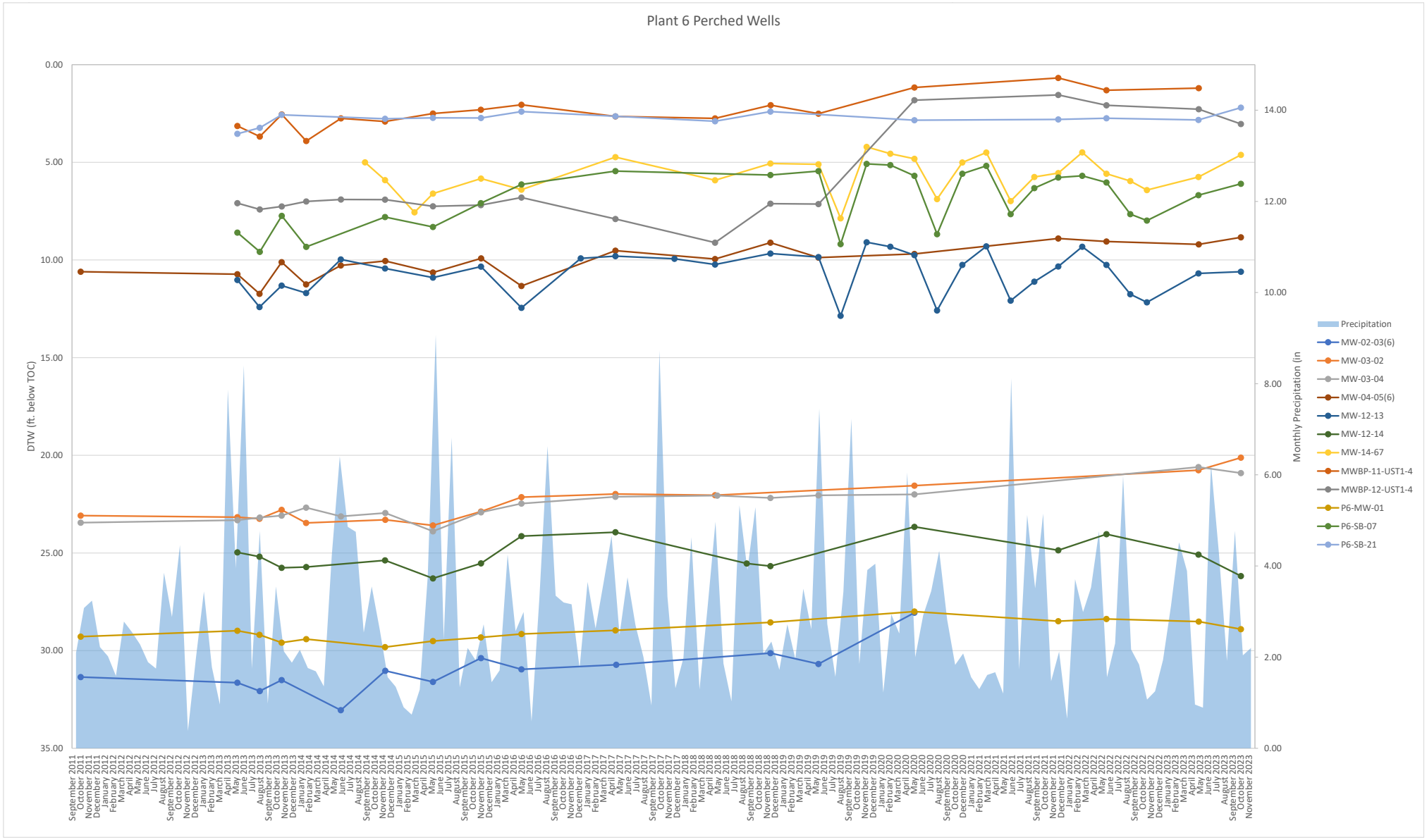
Groundwater Elevation Trend Hydrographs


Plant 2 Perched Wells
DTW (ft. below TOC)
Monthly Precipitation (in
0.00
5.00
10.00
15.00
20.00
25.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Precipitation
P2-SB-06
MW-01(2)
MW-12-07
MW-12-09
MW-14-55
MW-14-58
MW-14-60
MW-14-62
P2-MW-03
P2-SB-03
P2-SB-20


Plant 2 Perched Wells
DTW (ft. below TOC)
Monthly Precipitation (in
0.00
5.00
10.00
15.00
20.00
25.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Precipitation
P2-SB-06
MW-01(2)
MW-12-07
MW-12-09
MW-14-55
MW-14-58
MW-14-60
MW-14-62
P2-MW-03
P2-SB-03
P2-SB-20


Plant 3 Perched Wells
DTW (ft. below TOC)
Monthly Precipitation (in
0.00
5.00
10.00
15.00
20.00
25.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Precipitation
CH-14-RO
MW-18-88
MW-18-89
MW-18-92
MW-18-95
MW-18-98
P3-SB-07
P3-SB-28
UNK-15


Plant 3 Deep Wells
DTW (ft. below TOC)
Monthly Precipitation (in
50.00
55.00
60.00
65.00
70.00
75.00
80.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Precipitation
MW-02-04(3)
MW-04-02(3)
MW-04-03(3)
MW-12-20
MW-12-21
MW-13-25
MW-13-30
MW-13-37
MW-13-38
MW-13-41
MW-13-46
MW-13-47
MW-18-101
MW-88-1
MW-91-3
MW-91-5


Plant 6 Perched Wells
DTW (ft. below TOC)
Monthly Precipitation (in
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Precipitation
MW-02-03(6)
MW-03-02
MW-03-04
MW-04-05(6)
MW-12-13
MW-12-14
MW-14-67
MWBP-11-UST1-4
MWBP-12-UST1-4
P6-MW-01
P6-SB-07
P6-SB-21

Appendix F

Mann-Kendall Stability Analysis Trend Plots

TABLE F-1
Summary Statistics and Trend Results
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Lansing, MI
May, 2024

Well ID	Analyte	Date Range	Figure	FOD	Detected Results Summary [1]				Mann-Kendall Test [2]			
					Range	Mean	Median	SD	Result[4]	MK Result Note	P-Value	S Value
CH-14-RO	Perfluorohexanesulfonic acid (PFHxS)	12/16 - 11/23	F-1	13 / 13	1000 - 2520	1710	1600	470	DWN	--	0.002	-47
CH-14-RO	Perfluorooctane sulfonic acid (PFOS)	12/16 - 11/23	F-2	13 / 13	7100 - 13000	10800	11200	1810	DWN	--	0.012	-38
CH-14-RO	Perfluorooctanoic acid (PFOA)	12/16 - 11/23	F-3	13 / 13	57.8 - 190	107	114	33.9	NST	--	0.232	-13
MW-02-02(6)	1,4-Dioxane	10/11 - 10/23	F-4	9 / 9	11 - 23	19.7	21	3.7	NST	--	0.500	1
MW-03-06	Vinyl chloride	10/11 - 06/22	F-5	14 / 16	4 - 12	9.9	11	2.7	NST	--	0.445	4
MW-12-09	Perfluorooctanoic acid (PFOA)	06/18 - 10/23	F-6	10 / 10	11.9 - 16	14.2	14.9	1.4	UP	--	0.030	22
MW-12-12	Perfluorononanoic acid (PFNA)	06/19 - 11/23	F-7	18 / 18	3.6 - 12.6	8.2	7.9	2.3	DWN	--	<0.001	-92
MW-12-12	Perfluorooctane sulfonic acid (PFOS)	06/18 - 11/23	F-8	19 / 19	22 - 67.5	44.8	43.5	10.9	DWN	--	0.004	-77
MW-12-12	Perfluorooctanoic acid (PFOA)	06/18 - 11/23	F-9	19 / 19	52 - 130	86.5	83	19.1	NST	--	0.444	-5
MW-12-21	1,4-Dioxane	02/13 - 11/23	F-10	27 / 28	118 - 510	285	251	121	DWN	--	<0.001	-222
MW-13-22	1,4-Dioxane	03/13 - 11/23	F-11	35 / 35	45 - 270	153	158	53.3	DWN	--	0.013	-157
MW-13-25	1,4-Dioxane	04/13 - 11/23	F-12	20 / 24	3 - 25	11.6	12	6.5	DWN	--	0.089	-55
MW-13-29	1,4-Dioxane	04/13 - 10/23	F-13	22 / 22	7 - 130	25.3	20.5	24.9	DWN	--	<0.001	-134
MW-13-34	1,4-Dioxane	08/13 - 11/23	F-14	32 / 32	17 - 127	76.8	78.5	22.6	UP	--	<0.001	265
MW-13-36R	Perfluorononanoic acid (PFNA)	06/19 - 10/23	F-15	18 / 18	11 - 16.5	13.6	13.8	1.5	NST	--	0.211	22
MW-13-36R	Perfluorooctane sulfonic acid (PFOS)	06/19 - 10/23	F-16	18 / 18	37 - 56.7	46	46.1	4.9	DWN	--	0.006	-67
MW-13-36R	Perfluorooctanoic acid (PFOA)	06/19 - 10/23	F-17	18 / 18	57.1 - 81.1	68.4	68.45	7.1	NST	--	0.105	34
MW-13-45	1,4-Dioxane	12/13 - 10/23	F-18	26 / 27	24 - 58	41.5	41.5	11.2	NST	--	0.385	-15
MW-13-48	1,4-Dioxane	12/13 - 11/23	F-19	26 / 26	24 - 380	144	132	89.5	DWN	--	0.049	-76
MW-14-56	1,4-Dioxane	09/14 - 10/23	F-20	16 / 18	6 - 17	9.4	8.5	3.4	UP	--	<0.001	105
MW-14-58R	1,4-Dioxane	12/21 - 10/23	F-21	10 / 10	173 - 520	283	222	128	DWN	--	0.019	-24
MW-14-59	Perfluorooctanoic acid (PFOA)	06/18 - 10/23	F-22	9 / 10	6.7 - 15	9.4	8.8	2.3	NST	--	0.300	7
MW-14-59	1,1-Dichloroethene	09/14 - 06/22	F-23	11 / 11	16 - 39	25.2	24	7.3	DWN	--	0.036	-24
MW-14-59	1,4-Dioxane	09/14 - 10/23	F-24	13 / 13	7 - 280	121	80	98.5	DWN	--	<0.001	-71
MW-14-60	Perfluorooctane sulfonic acid (PFOS)	05/18 - 10/23	F-25	9 / 10	5.6 - 44	24.3	28	13.1	NST	--	0.108	15
MW-14-60	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	F-26	10 / 10	14.7 - 41	29.4	30.6	10.3	UP	--	0.019	24
MW-14-60	1,4-Dioxane	09/14 - 10/23	F-27	13 / 13	6 - 200	112	131	64.3	DWN	--	<0.001	-72
MW-14-60	Vinyl chloride	09/14 - 06/22	F-28	11 / 11	2 - 12	5.5	4	3.3	UP	--	0.064	20
MW-14-61	1,4-Dioxane	09/14 - 10/23	F-29	20 / 23	5 - 152	50.8	17	60.1	NST	--	0.262	25
MW-14-62	Perfluorononanoic acid (PFNA)	05/18 - 10/23	F-30	10 / 10	5.1 - 11.9	8.1	7.7	1.9	NST	--	0.398	-4
MW-14-62	Perfluorooctane sulfonic acid (PFOS)	05/18 - 10/23	F-31	10 / 10	47 - 86.8	63.2	60.5	13.5	DWN	--	0.066	-18
MW-14-62	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	F-32	10 / 10	36.5 - 94.3	56.8	52.5	16.3	NST	--	0.431	-3
MW-14-62	1,4-Dioxane	09/14 - 10/23	F-33	13 / 13	27 - 230	86.3	63	63.3	NST	--	0.214	-14
MW-14-67	Perfluorooctanoic acid (PFOA)	06/19 - 10/23	F-34	17 / 17	10.3 - 27.1	15.6	13	5.3	UP	--	0.063	38
MW-14-70	Perfluorooctanoic acid (PFOA)	05/18 - 10/23	F-35	18 / 18	6.6 - 51.9	27.5	30.75	13.3	NST	--	0.105	-34
MW-15-72	1,4-Dioxane	03/16 - 10/23	F-36	25 / 25	11 - 310	184	199	93.7	DWN	--	0.021	-88
MW-16-80	1,4-Dioxane	06/16 - 10/23	F-37	15 / 16	7 - 46	24.3	23	8	DWN	--	0.087	-31
MW-16-81	1,4-Dioxane	06/16 - 10/23	F-38	26 / 26	70 - 3200	978	535	991	NST	--	0.207	-38
MW-16-84	1,4-Dioxane	09/16 - 10/23	F-39	25 / 25	15 - 81	50.8	52	15.4	NST	--	0.426	9
MW-16-85	1,4-Dioxane	12/16 - 10/23	F-40	15 / 15	1 - 28	8.9	7	6.8	UP	--	0.097	27
MW-17-86	1,4-Dioxane	04/17 - 10/23	F-41	18 / 18	11 - 106	57.3	58.5	32.2	DWN	--	0.092	-36
MW-18-103	Perfluorohexanesulfonic acid (PFHxS)	03/19 - 11/23	F-42	18 / 18	16.8 - 190	54.8	46.35	42	UP	--	<0.001	98
MW-18-88	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	F-43	19 / 19	46.1 - 860	201	155	178	UP	--	0.005	74
MW-18-88	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	F-44	19 / 19	3.1 - 17	6.8	6.1	3.2	UP	--	0.005	74
MW-18-89	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	F-45	18 / 18	74 - 289	149	150.5	45	NST	--	0.152	-28
MW-18-89	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	F-46	18 / 18	10 - 21.4	13.5	13	2.9	DWN	--	0.069	-40
MW-18-90	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	F-47	18 / 18	230 - 1200	949	972.5	197	NST	--	0.410	-7
MW-18-90	Perfluorooctanoic acid (PFOA)	12/18 - 11/23	F-48	18 / 18	8.1 - 21.3	16.4	16.5	3.1	DWN	--	0.074	-39
MW-18-91	Perfluorooctane sulfonic acid (PFOS)	12/18 - 11/23	F-49	18 / 18	41 - 89	56.3	52.7	12.7	DWN	--	0.007	-66
MW-18-95	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	F-50	19 / 19	27 - 115	48.5	41	23.5	DWN	--	0.014	-64
MW-18-98	Perfluorononanoic acid (PFNA)	03/19 - 11/23	F-51	14 / 20	0.93 - 13	3.5	2.5	3.5	UP	--	<0.001	134
MW-18-98	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	F-52	20 / 20	33 - 440	147	109.5	111	NST	--	0.128	36
MW-18-98	Perfluorooctanoic acid (PFOA)	03/19 - 11/23	F-53	20 / 20	1.7 - 42	19.5	18.05	12.5	DWN	--	0.001	-96
MW-18-99	Perfluorooctane sulfonic acid (PFOS)	03/19 - 11/23	F-54	20 / 20	46.7 - 170	89.4	79.6	33.8	NST	--	0.361	-12
MW-19-115	1,4-Dioxane	03/20 - 10/23	F-55	12 / 12	2 - 13	7.4	7.5	3.3	DWN	--	0.081	-21
MW-19-116	1,4-Dioxane	03/20 - 10/23	F-56	12 / 12	54 - 82	66.3	66.5	9.1	NST	--	0.339	7
MW-19-120	1,4-Dioxane	12/19 - 10/23	F-57	13 / 13	7 - 198	69.8	28	73.7	DWN	--	<0.001	-53
MW-19-123	1,4-Dioxane	12/19 - 10/23	F-58	16 / 16	20 - 76	46.5	47	18.1	DWN	--	0.088	-31
MW-19-124	1,4-Dioxane	12/19 - 10/23	F-59	12 / 12	90 - 420	206	189.5	83.9	DWN	--	0.043	-26
MW-20-126	1,4-Dioxane	07/20 - 10/23	F-60	14 / 14	63 - 370	171	136.5	106	DWN	--	<0.001	-81
MW-20-127	1,4-Dioxane	07/20 - 10/23	F-61	14 / 14	85 - 180	138	139	22.6	UP	--	0.045	32
MW-20-129	1,4-Dioxane	07/20 - 10/23	F-62	14 / 14	60 - 140	93.4	82.5	24.9	DWN	--	<0.001	-60
MW-20-130	1,4-Dioxane	12/20 - 10/23	F-63	7 / 7	6 - 115	45.4	38	40.6	NST	5a	0.119	-9
MW-20-131	Perfluorooctanoic acid (PFOA)	02/21 - 10/23	F-64	8 / 8	27 - 45	37.1	38	5.5	NST	--	0.500	1
MW-20-131	Vinyl chloride	12/20 - 08/23	F-65	7 / 7	2 - 5	3.1	3	1.1	NST	5a	0.281	-5
MW-20-132	Perfluorononanoic acid (PFNA)	02/21 - 10/23	F-66	8 / 8	2.1 - 8.1	6.3	7.2	2.2	NST	--	0.199	-8
MW-20-132	Perfluorooctane sulfonic acid (PFOS)	02/21 - 10/23	F-67	8 / 8	6.9 - 20.2	15.8	17.5	4.8	DWN	--	0.024	-17
MW-20-132	Perfluorooctanoic acid (PFOA)	02/21 - 10/23	F-68	8 / 8	13 - 50	36.7	40	11.6	NST	--	0.138	-10
MW-20-132	Vinyl chloride	12/20 - 08/23	F-69	6 / 7	1 - 3	2.5	3	0.84	NST	5a	0.386	-3
MW-21-133	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	F-70	8 / 8	16 - 110	63.1	53.9	35.8	NST	--	0.406	3
MW-21-134	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	F-71	8 / 8	22.6 - 55	34.9	34.3	10.8	NST	--	0.274	6
MW-21-135	Perfluorooctanoic acid (PFOA)	03/21 - 11/23	F-72	8 / 8	38 - 63	46.3	45.5	7.6	NST	--	0.452	-2
MW-21-139	Perfluorohexanesulfonic acid (PFHxS)	12/21 - 10/23	F-73	7 / 7	180 - 300	254	260	39.9	NST	5a	0.236	6
MW-21-139	Perfluorononanoic acid (PFNA)	12/21 - 10/23	F-74	7 / 7	6.5 - 27	18.4	18	6.5	NST	5a	0.119	9
MW-21-139	Perfluorooctane sulfonic acid (PFOS)	12/21 - 10/23	F-75	7 / 7	680 - 2100	1500	1700	505	NST	5a	0.334	4
MW-21-139	Perfluorooctanoic acid (PFOA)	12/21 - 10/23	F-76	7 / 7	49 - 110	85.1	84	19.2	NST	5a	0.281	5
MW-22-144	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	F-77	8 / 8	5 - 12	7.3	6.95	2.3	NST	--	0.406	3
MW-22-145	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	F-78	8 / 8	11 - 32	18.9	18	6.4	NST	--	0.237	7
MW-22-151	Perfluorooctanoic acid (PFOA)	04/22 - 10/23	F-79	8 / 8	7.7 - 9.4	8.3	8.05	0.57	NST	--	0.317	5
MW-22-153	1,4-Dioxane	04/22 - 10/23	F-80	9 / 9	18 - 101	60.4	55	29.2	NST	--	0.238	-8
P2-MW-04	1,4-Dioxane	08/11 - 10/23	F-81	14 / 15	11 - 62	40.4	44.5	16	DWN	--	0.010	-48
P6-SB-07	Perfluorononanoic acid (PFNA)	06/19 - 11/23	F-82	17 / 17	74.6 - 220	139	140	47.7	NST	--	0.217	20
P6-SB-07	Perfluorooctane sulfonic acid (PFOS)	06/18 - 11/23	F-83	18 / 18	38 - 126	74	66.6	25.6	NST	--	0.410	-7
P6-SB-07	Perfluorooctanoic acid (PFOA)	06/18 - 11/23	F-84	18 / 18	640 - 1930	1280	1330	389	NST	--	0.470	3
PW-14-02	1,4-Dioxane	09/14 - 10/23	F-85	27 / 27	5 - 580	159	103	155	DWN	--	<0.001	-246
TW-14-02	1,4-Dioxane	06/15 - 10/23	F-86	27 / 34	3 - 3500	1100	400	1230	DWN	--	<0.001	-341
TW-15-11	1,4-Dioxane	06/15 - 11/23	F-87	19 / 19	5 - 250	102	51	92	DWN	--	<0.001	-92
UNK-15	Perfluorooctane sulfonic acid (PFOS)	06/19 - 11/23	F-88	17 / 17	810 - 1530	1170	1170	184	NST	--	0.170	-24
UNK-15	Perfluorooctanoic acid (PFOA)	06/19 - 11/23	F-89	17 / 17	24 - 49.1	34.4	33.1	7.1	DWN	--	<0.001	-78

Abbreviations:

-- insufficient data for calculating statistics (n < 4) or not available
FOD = frequency of detection (# detects / # samples)
mean = arithmetic mean
SD = standard deviation

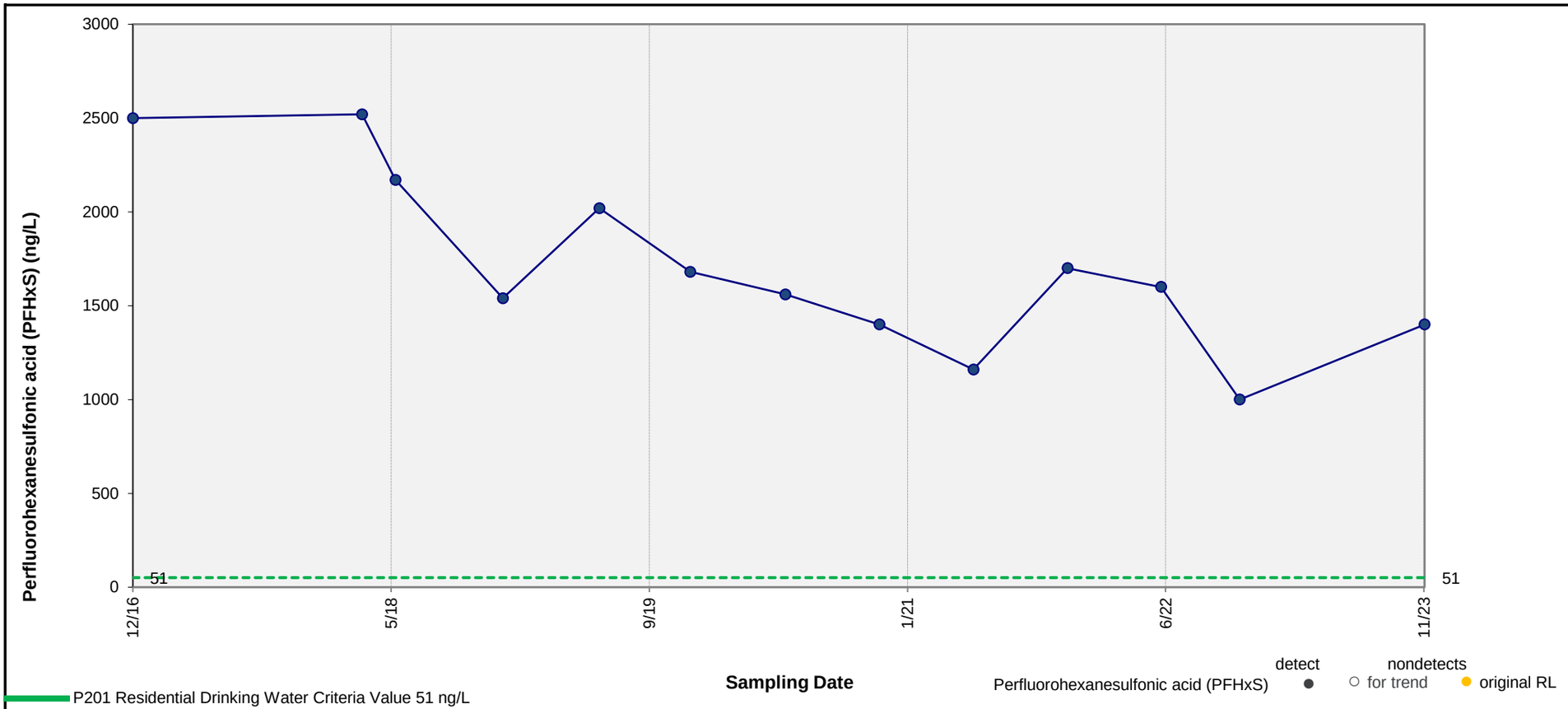
NST = no significant trend
NT = no trend
DWN = downward trend
UP = upward trend

Notes:

1. All analytical results for PFAS are in ng/L and VOCs are in µg/L.
   Result values less than 10 are reported to 2 significant figures; values greater than 10 are reported to 3 significant figures. P-values are reported to 3 decimal places.
2. Trend results are presented when at least seven samples, 50% detected values, and 25% exceedances in the last six samples are available. Significance of trends evaluated at 90% confidence (alpha = 0
3. Non-detects were assigned a common value less than the minimum detected value, equal to half the minimum reporting limit (RL) in the dataset (USEPA, 2009).
   If half the minimum RL was greater than the minimum detected value, then half the minimum detect was assigned.
4. Statistically significant trend defined as having p-value ≤ 0.1, or 90% confidence.
5a. MK and Sen's Trend results for datasets with fewer than 8 samples may not be reliable and should be treated with caution.
6. All well/analyte pairs were analyzed in 2023, except for 1,1-DCE at MW-14-59 and vinyl chloride at MW-03-06 and MW-14-60.
   These datasets are still included in the MK results since the wells were sampled in 2023.

Reference:

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Unified Guidance. EPA/530/R-09/007, 2009.



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

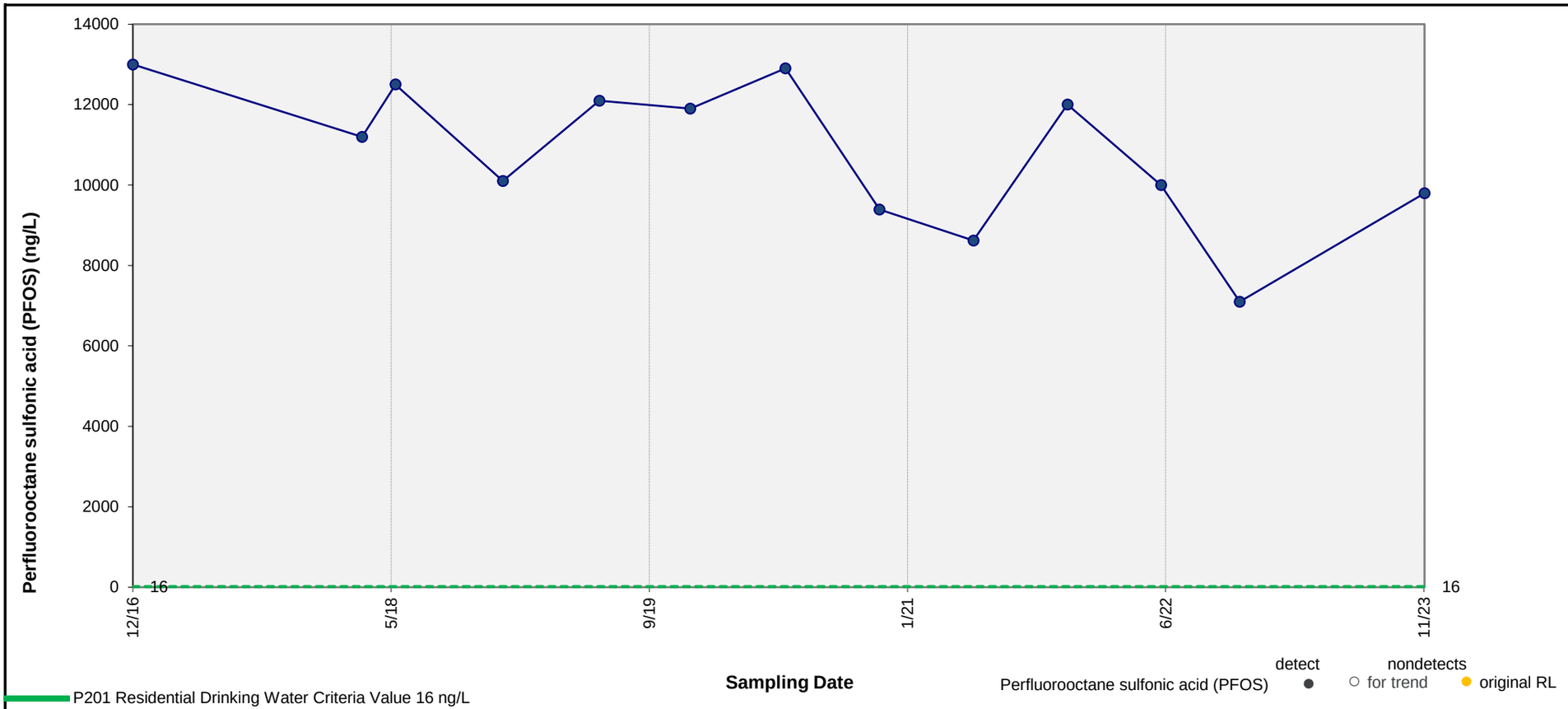
p value = 0.002 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorohexanesulfonic acid (PFHxS) in Well CH-14-RO

RACER Lansing

Figure F-1



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

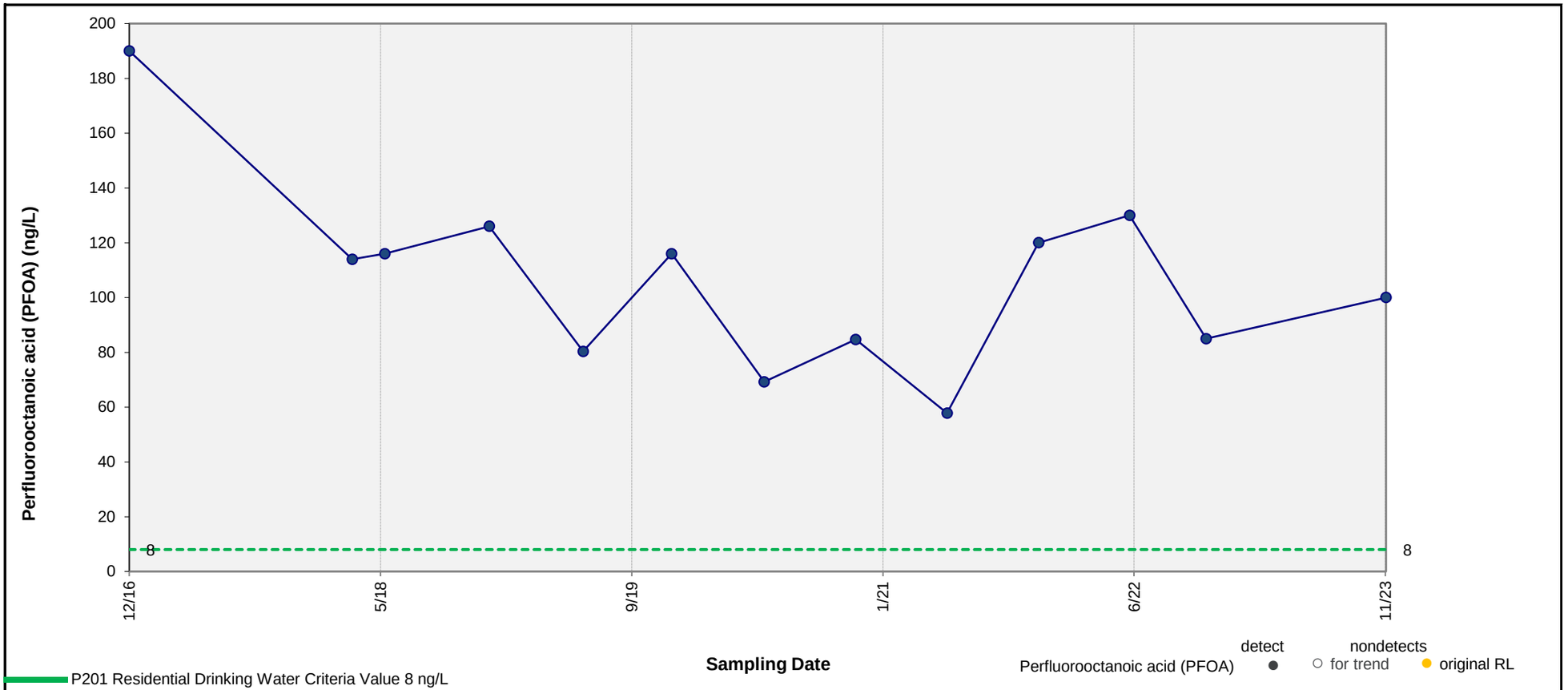
p value = 0.012 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well CH-14-RO

RACER Lansing

Figure F-2



Results of Mann-Kendall Test for Trend: **No Significant Trend**

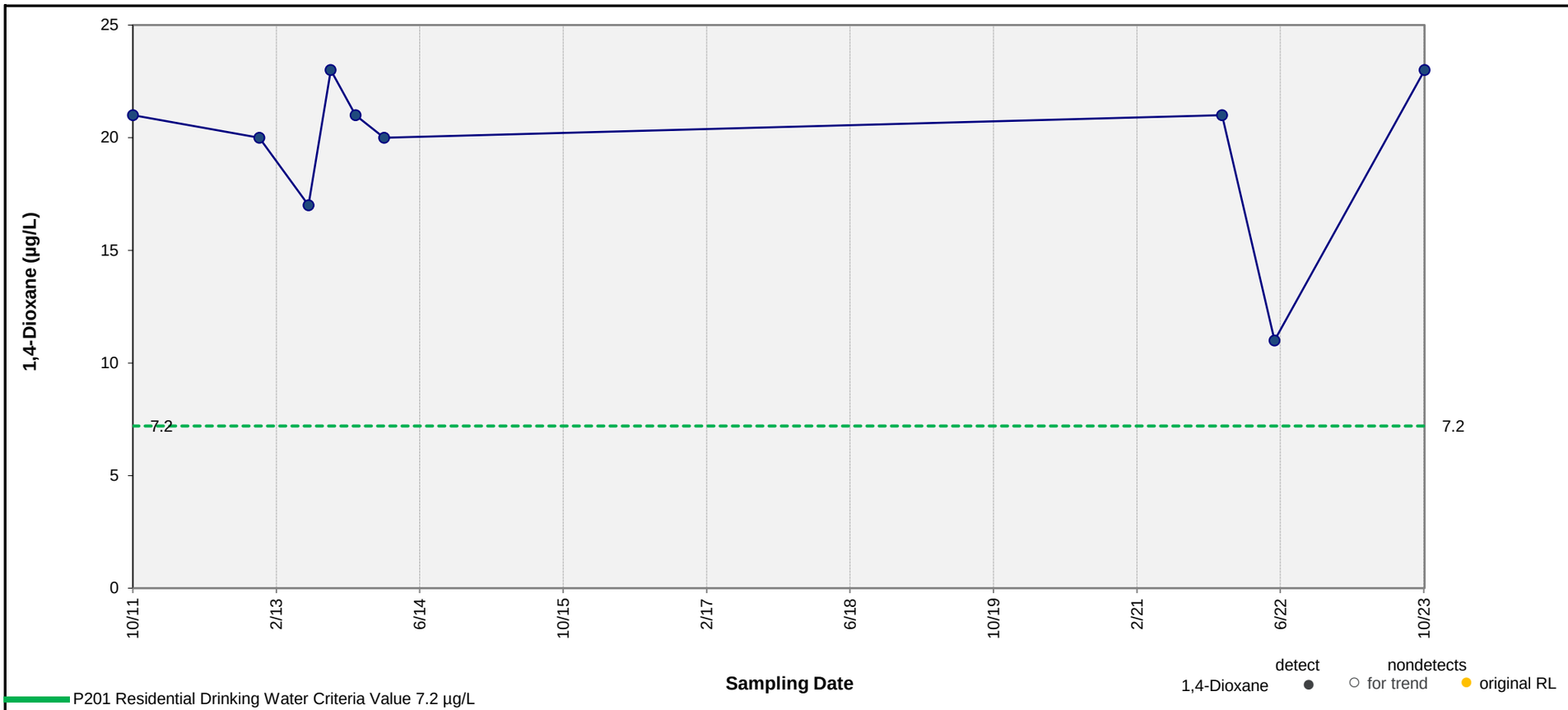
p value = 0.232 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well CH-14-RO

RACER Lansing

Figure F-3



Results of Mann-Kendall Test for Trend: **No Significant Trend**

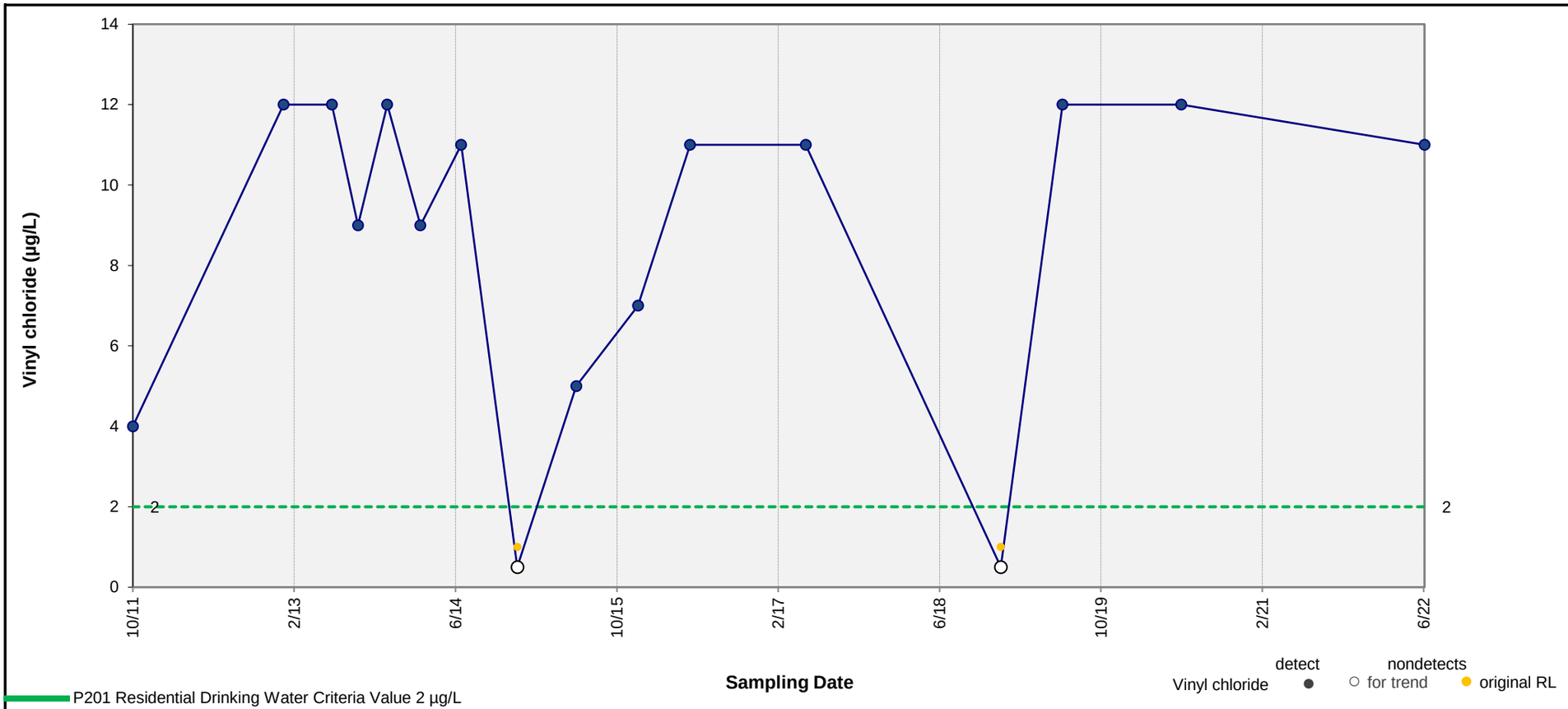
p value = 0.500 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-02-02(6)

RACER Lansing

Figure F-4



Results of Mann-Kendall Test for Trend: **No Significant Trend**

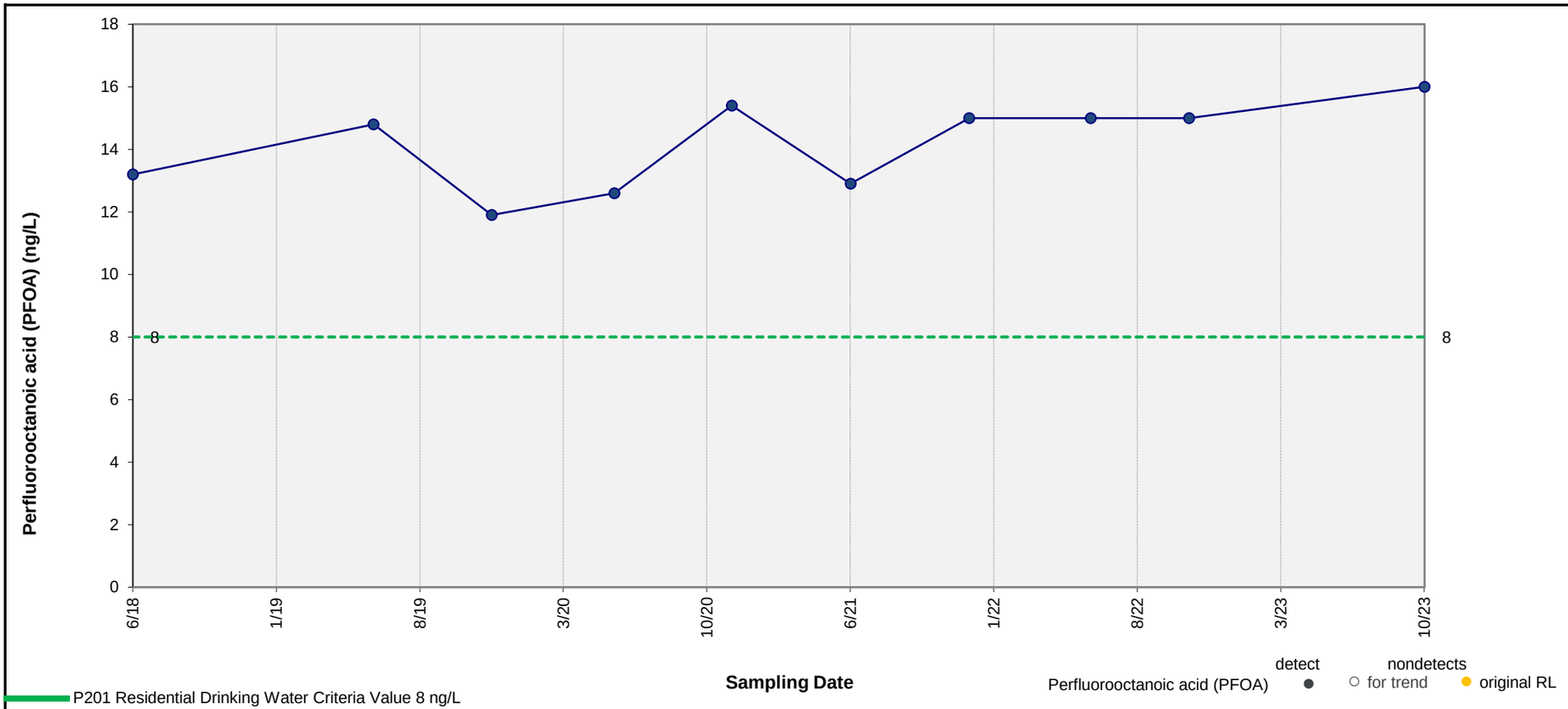
p value = 0.445 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Vinyl chloride in Well MW-03-06

RACER Lansing

Figure F-5



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

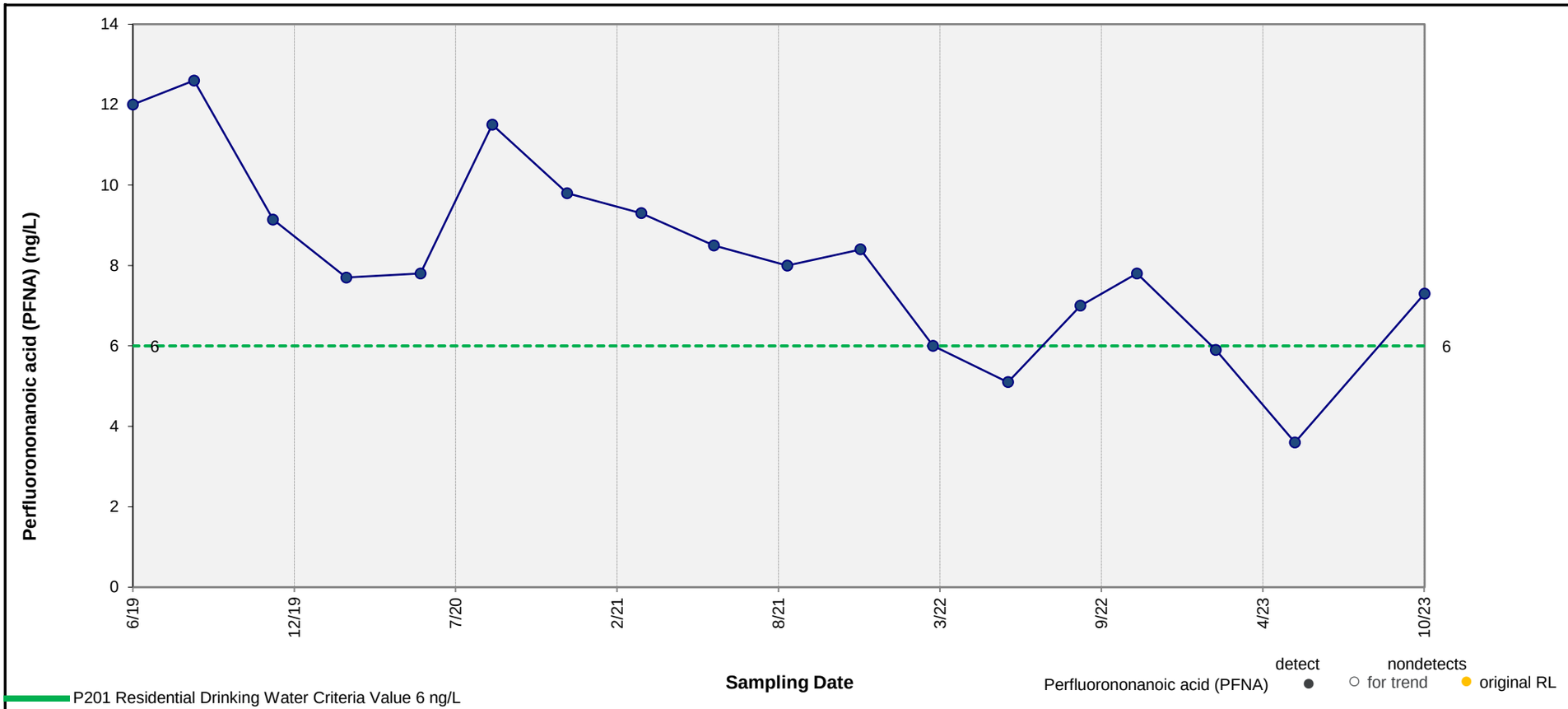
p value = 0.030 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-12-09

RACER Lansing

Figure F-6



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

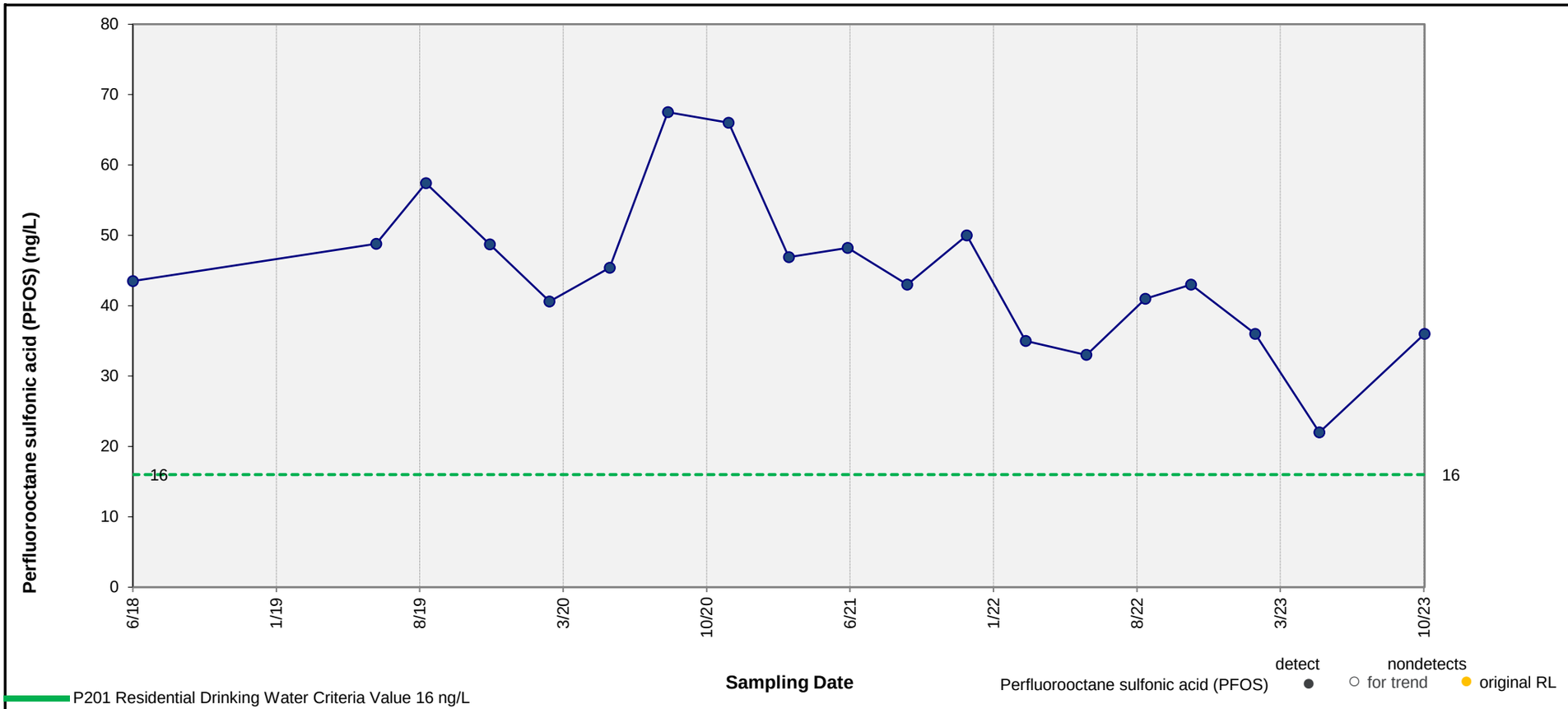
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-12-12

RACER Lansing

Figure F-7



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

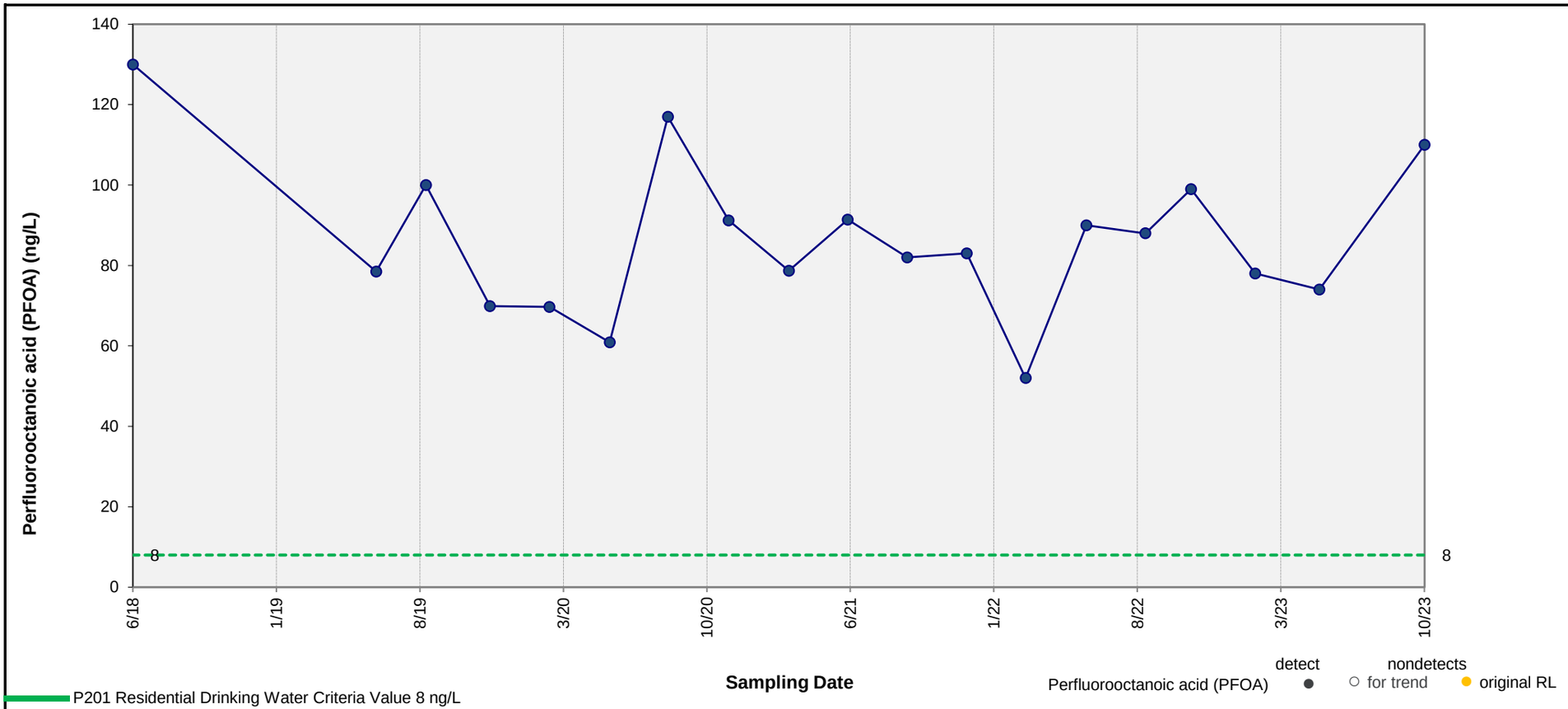
p value = 0.004 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-12-12

RACER Lansing

Figure F-8



Results of Mann-Kendall Test for Trend: **No Significant Trend**

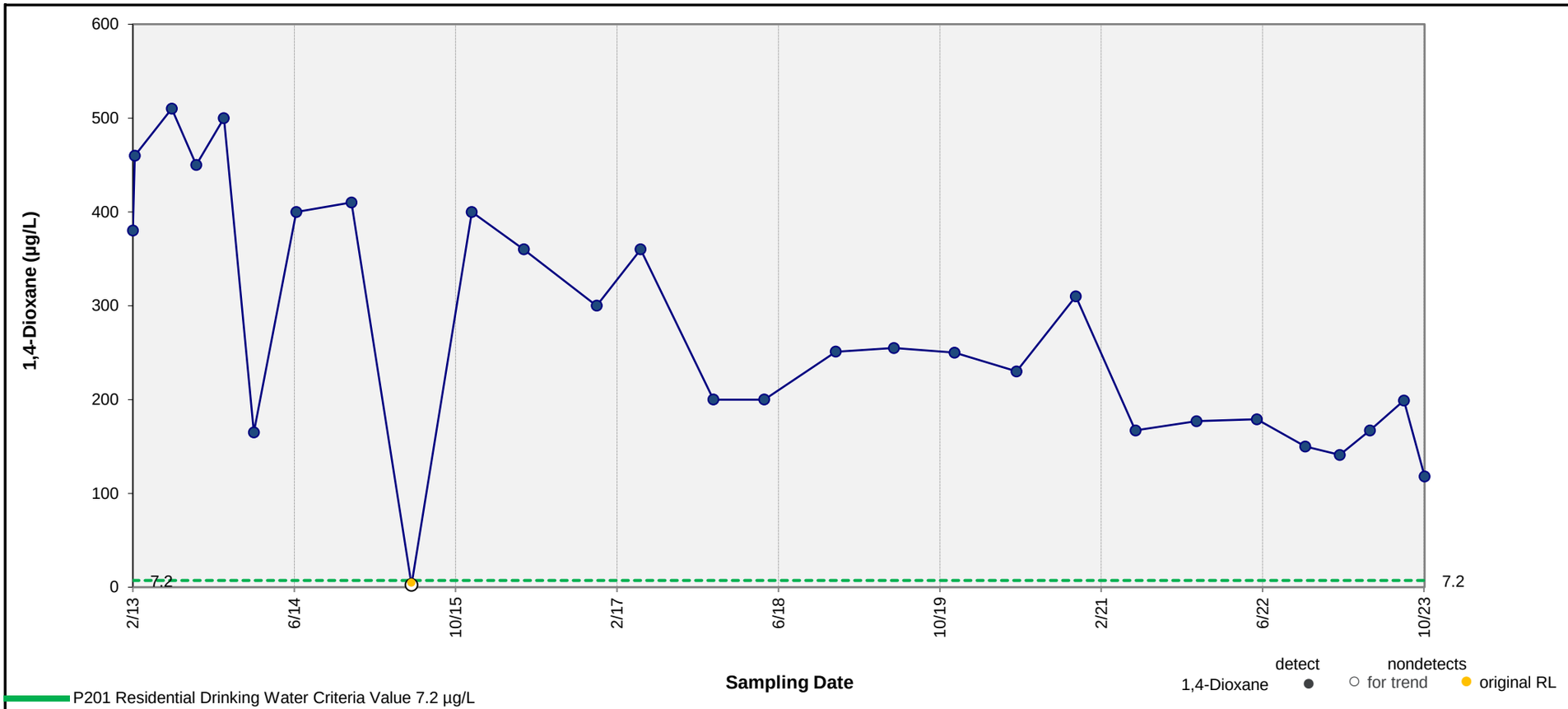
p value = 0.444 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-12-12

RACER Lansing

Figure F-9



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

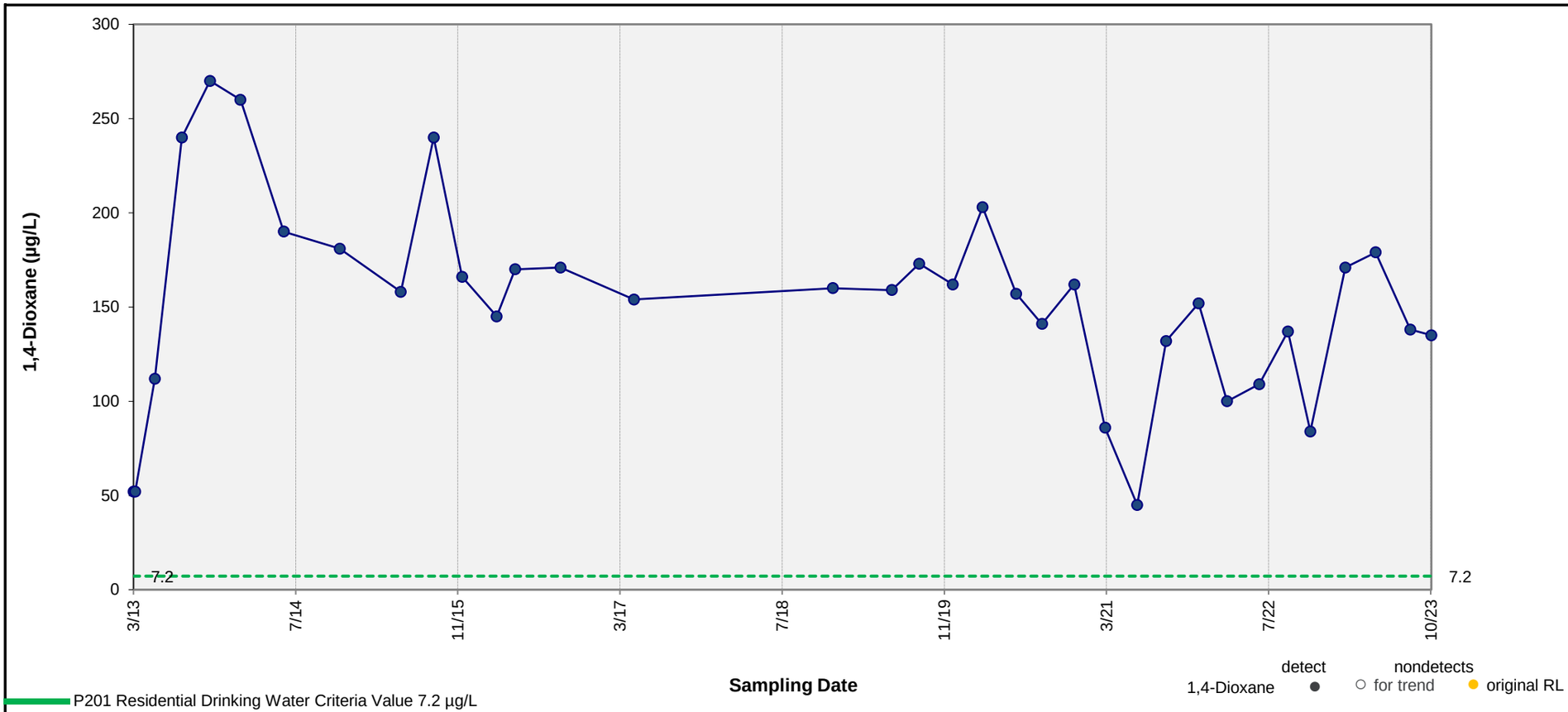
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-12-21

RACER Lansing

Figure F-10



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

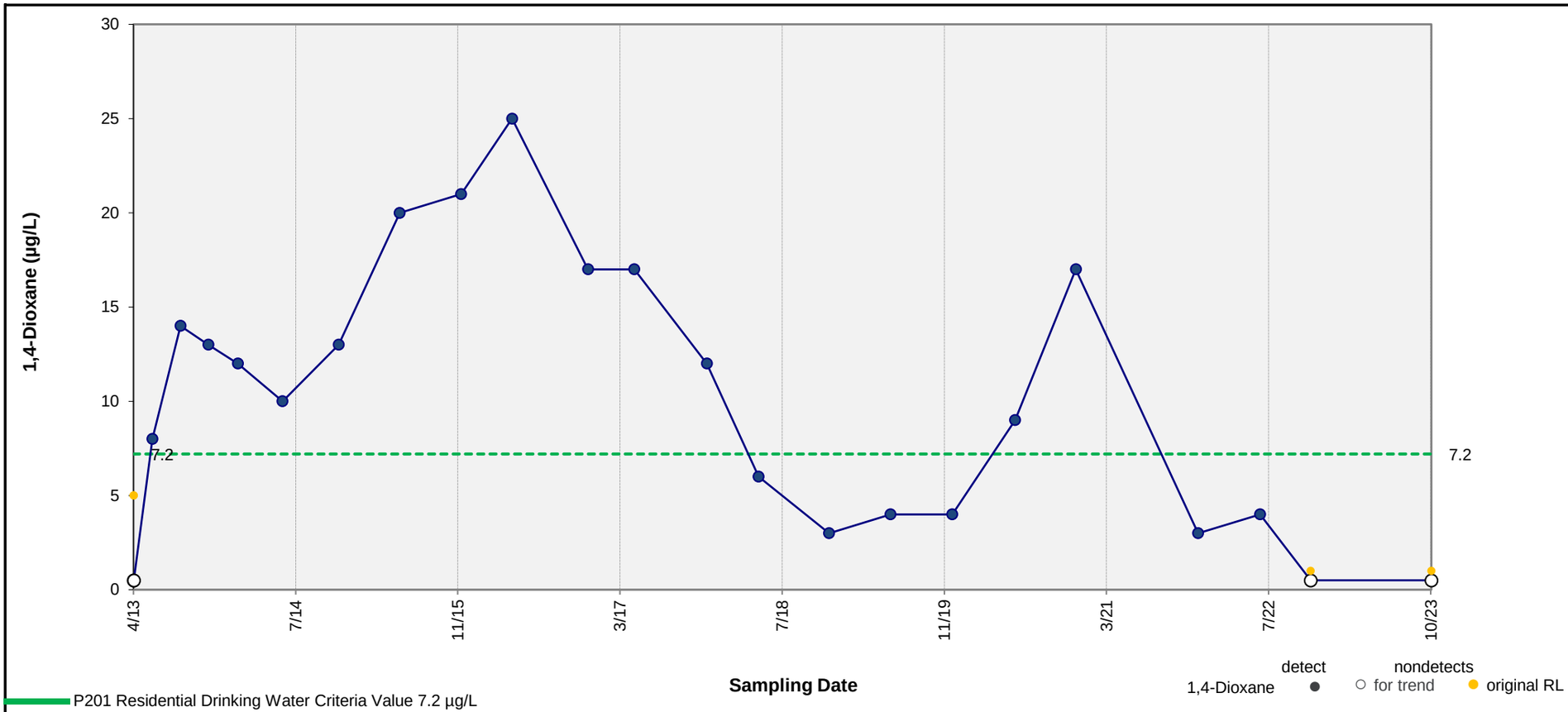
p value = 0.013 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-22

RACER Lansing

Figure F-11



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

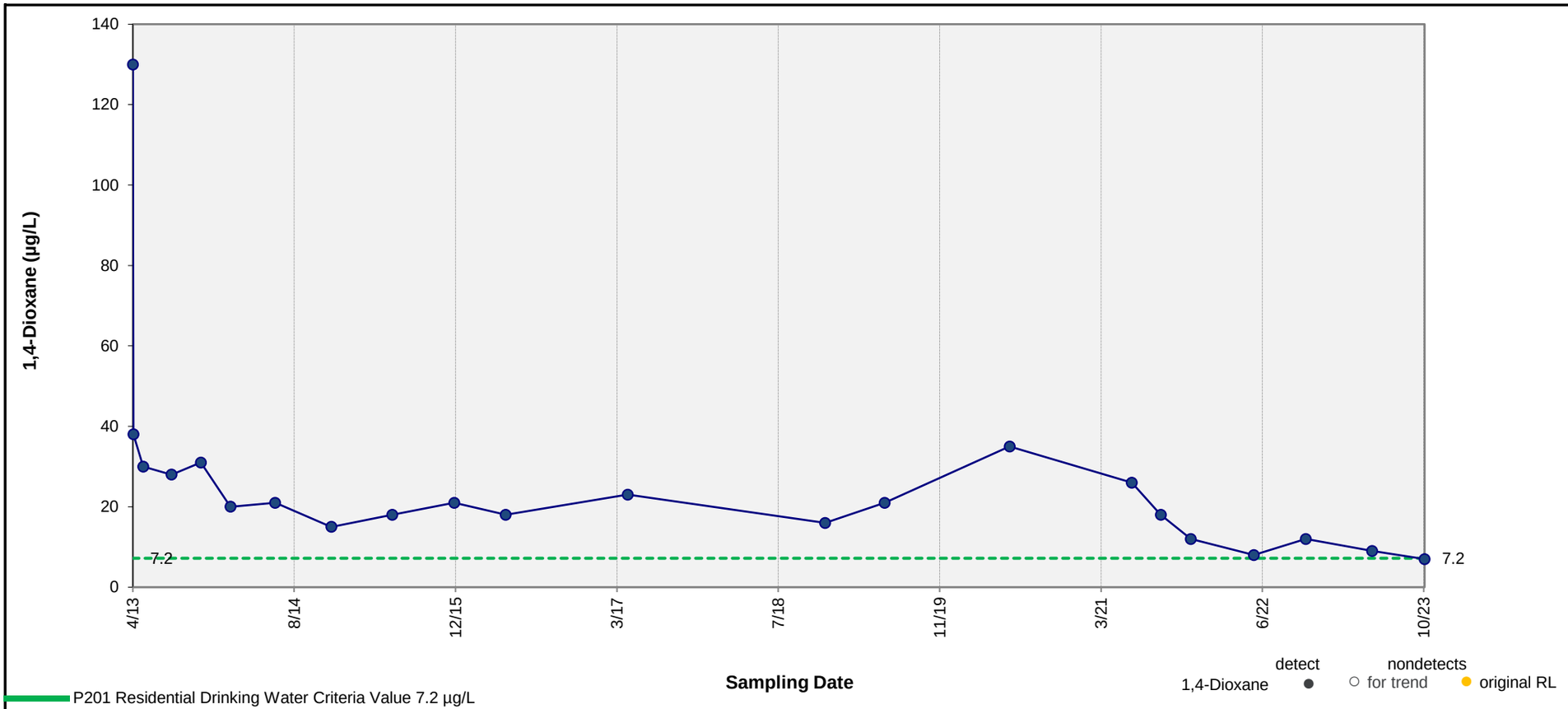
p value = 0.089 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-25

RACER Lansing

Figure F-12



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

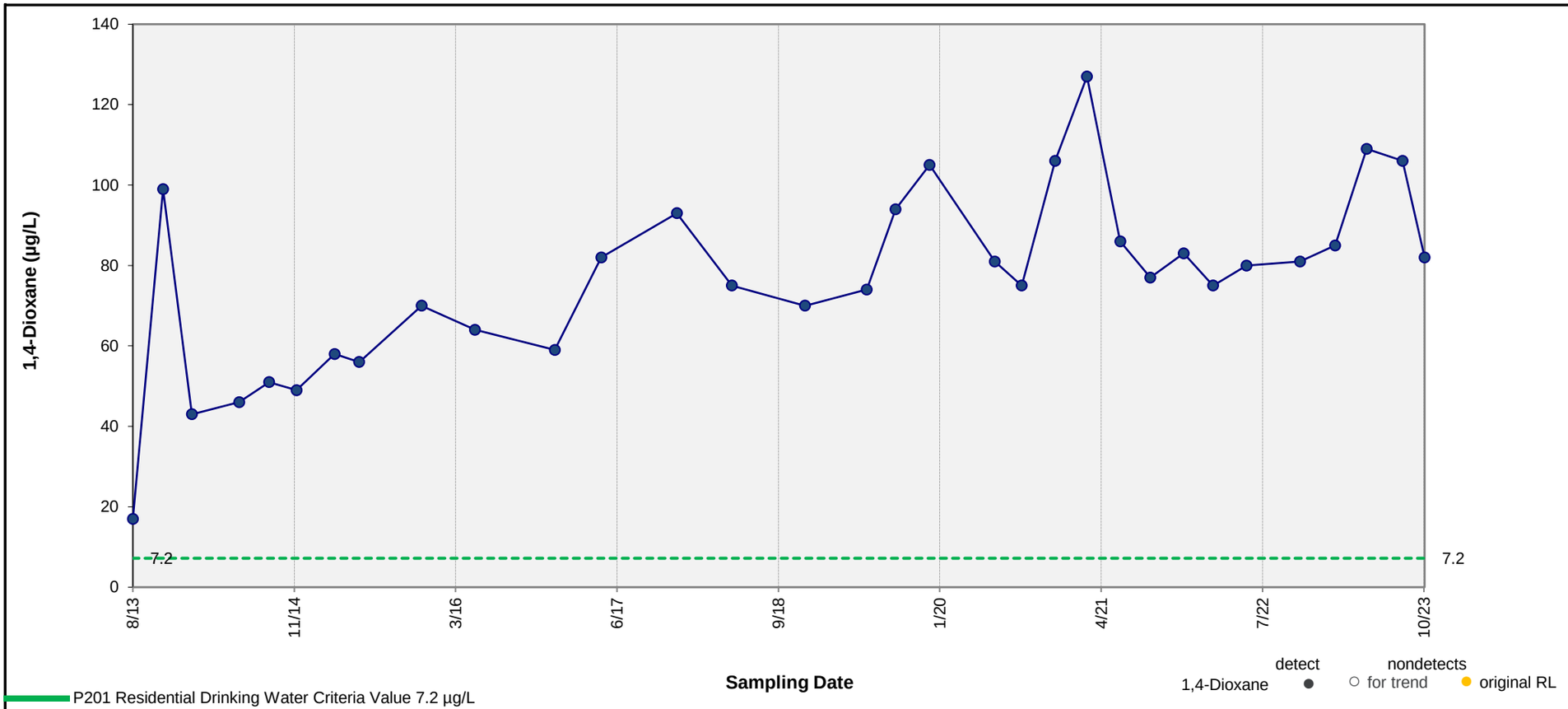
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-29

RACER Lansing

Figure F-13



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

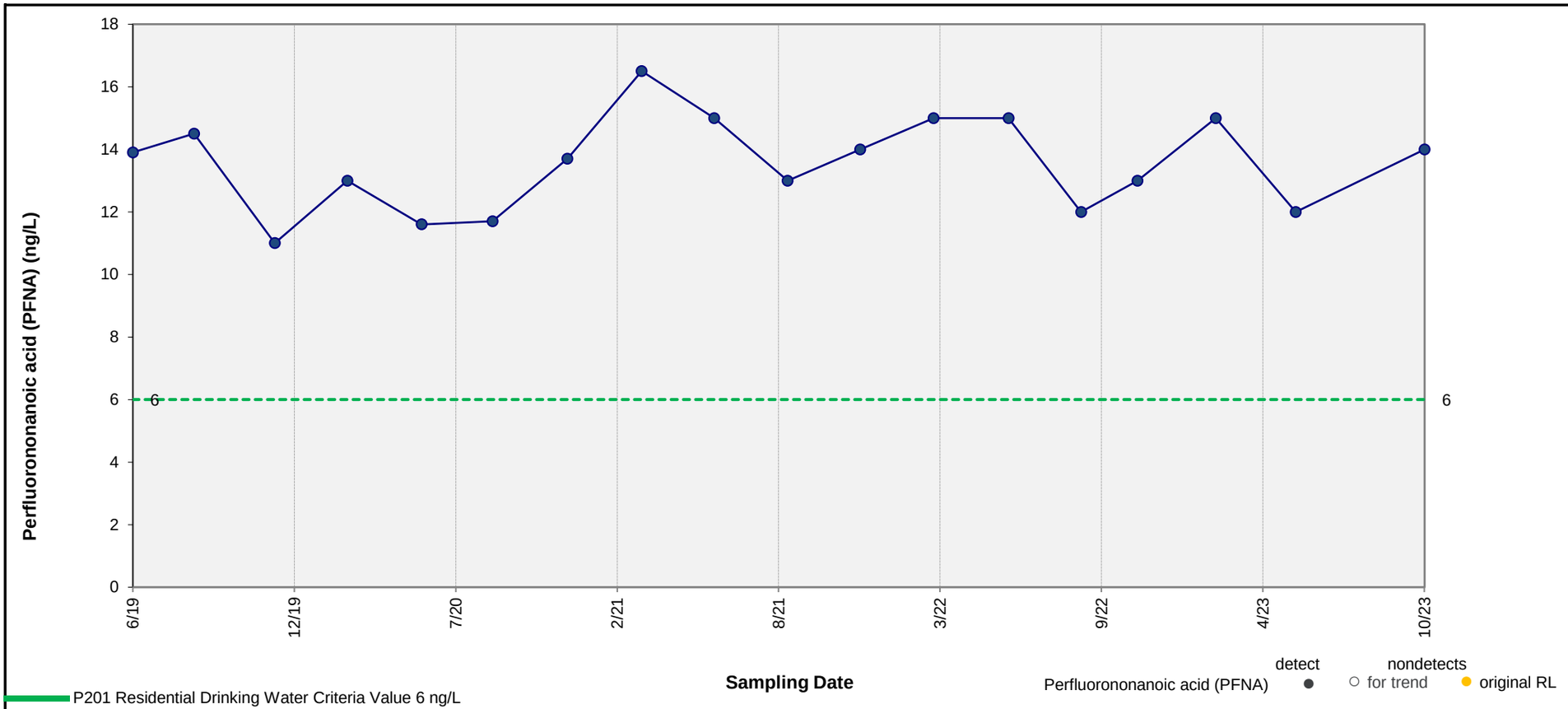
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-34

RACER Lansing

Figure F-14



Results of Mann-Kendall Test for Trend: **No Significant Trend**

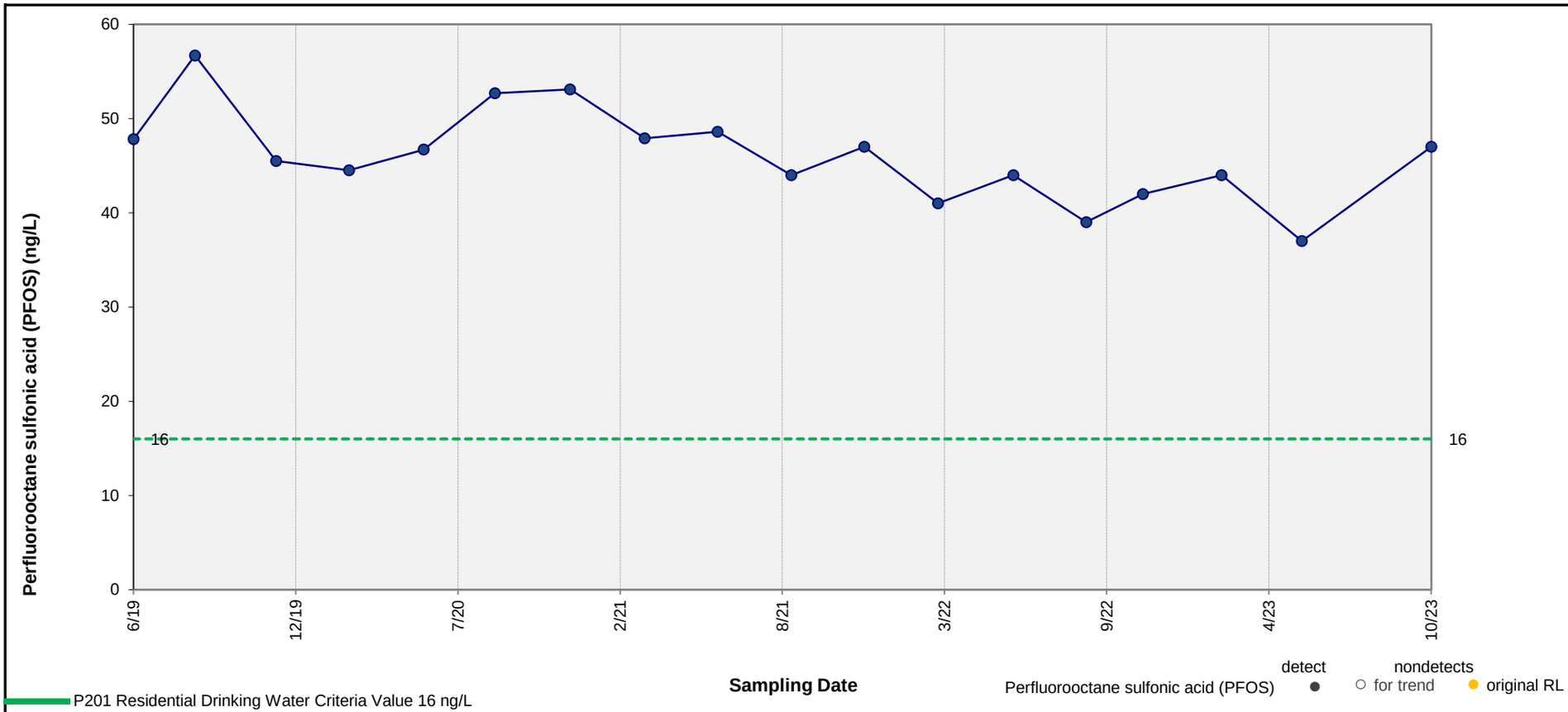
p value = 0.211 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-13-36R

RACER Lansing

Figure F-15



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

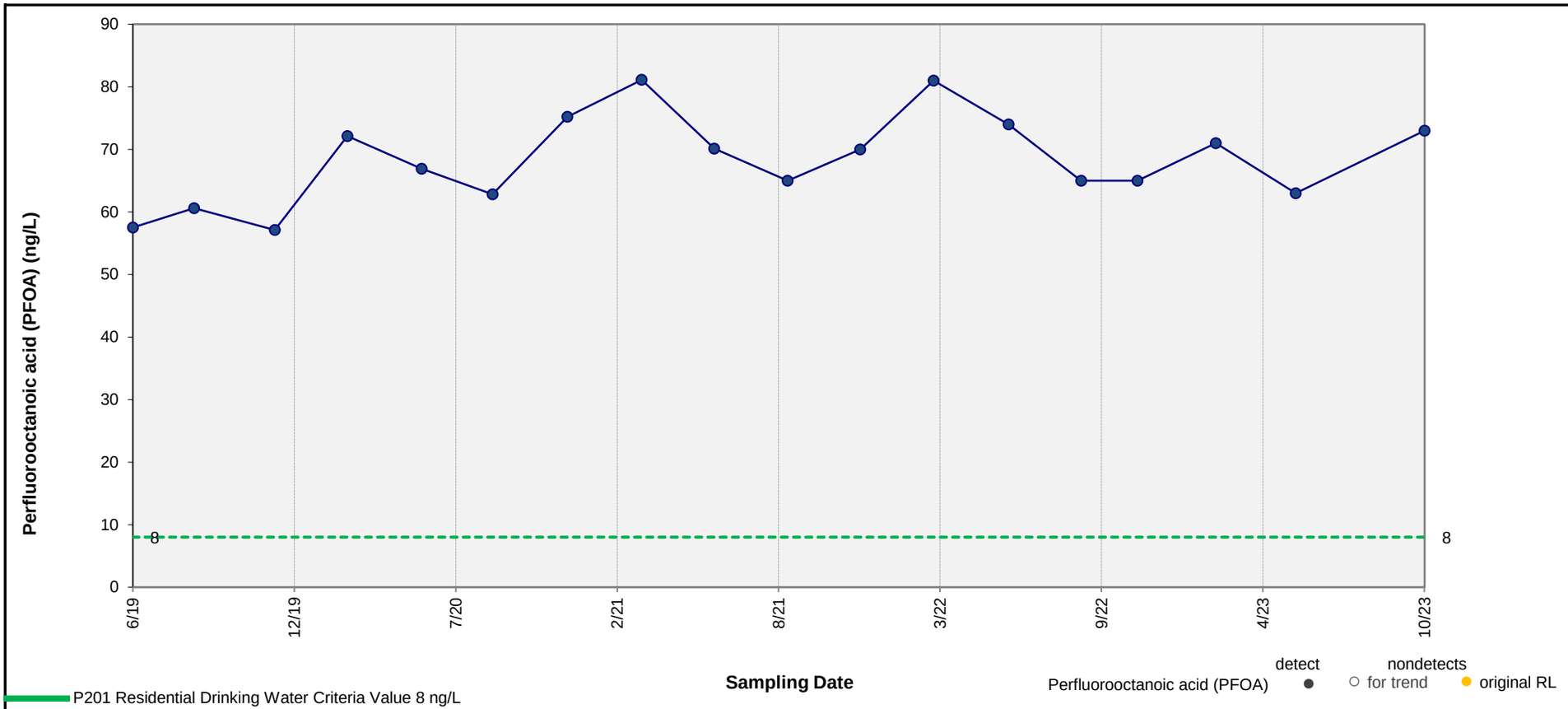
p value = 0.006 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-13-36R

RACER Lansing

Figure F-16



Results of Mann-Kendall Test for Trend: **No Significant Trend**

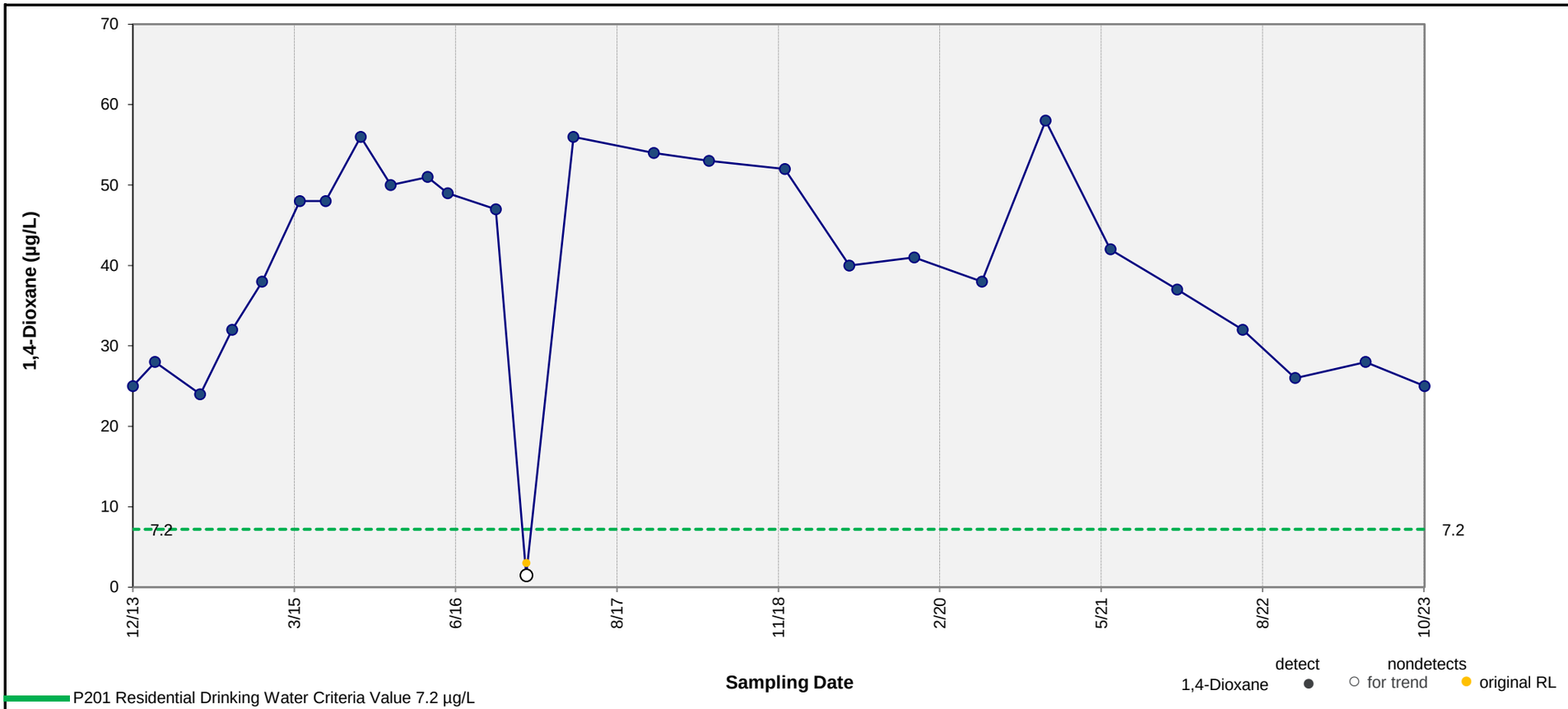
p value = 0.105 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-13-36R

RACER Lansing

Figure F-17



Results of Mann-Kendall Test for Trend: **No Significant Trend**

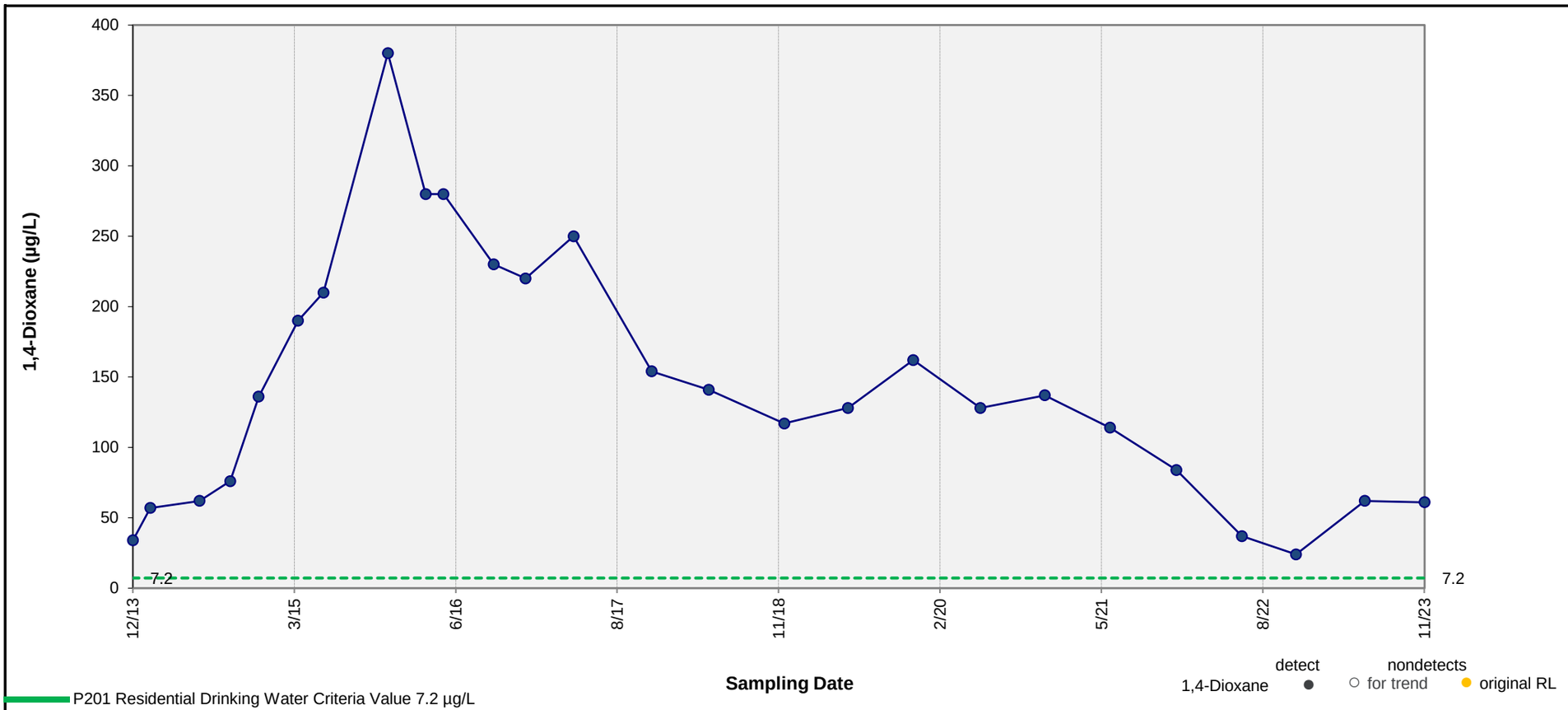
p value = 0.385 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-45

RACER Lansing

Figure F-18



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

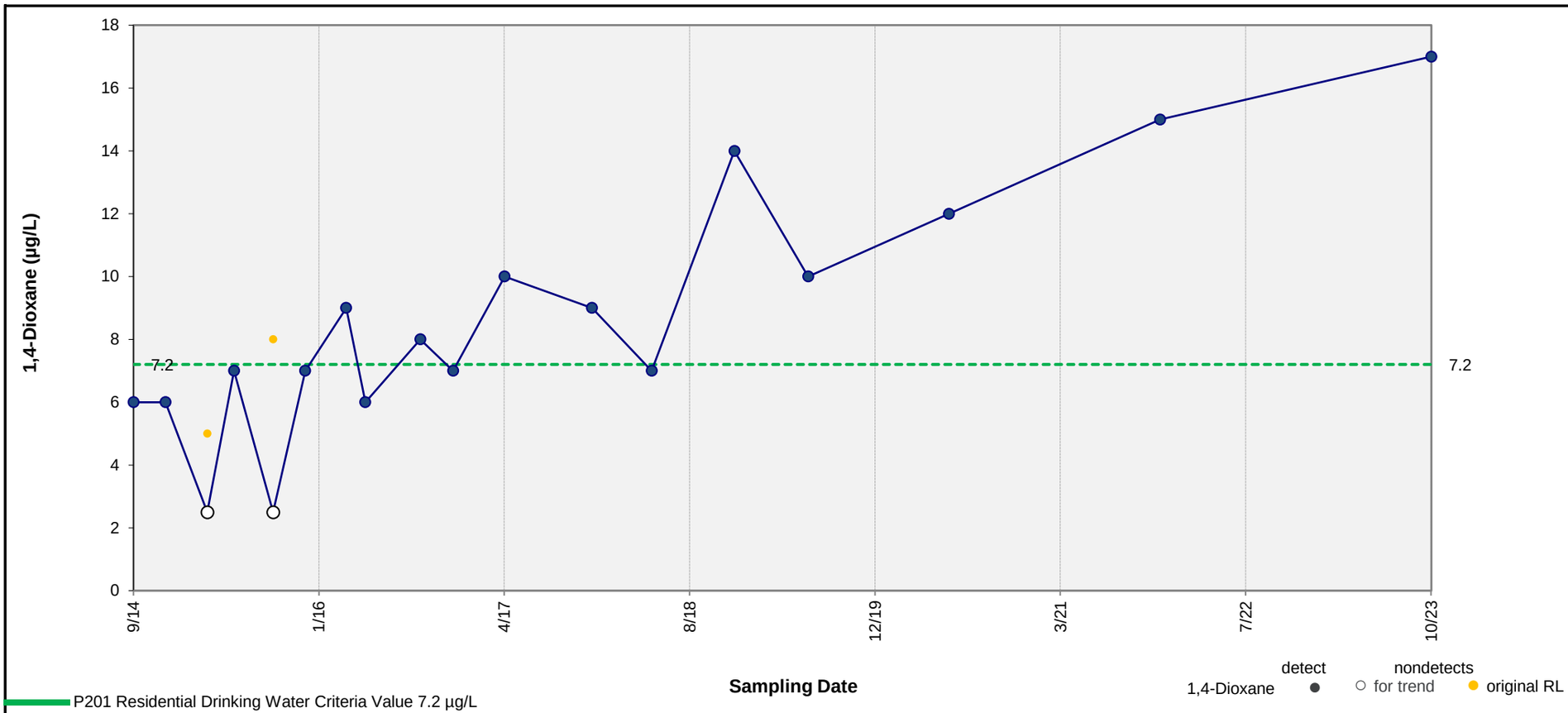
p value = 0.049 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-13-48

RACER Lansing

Figure F-19



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

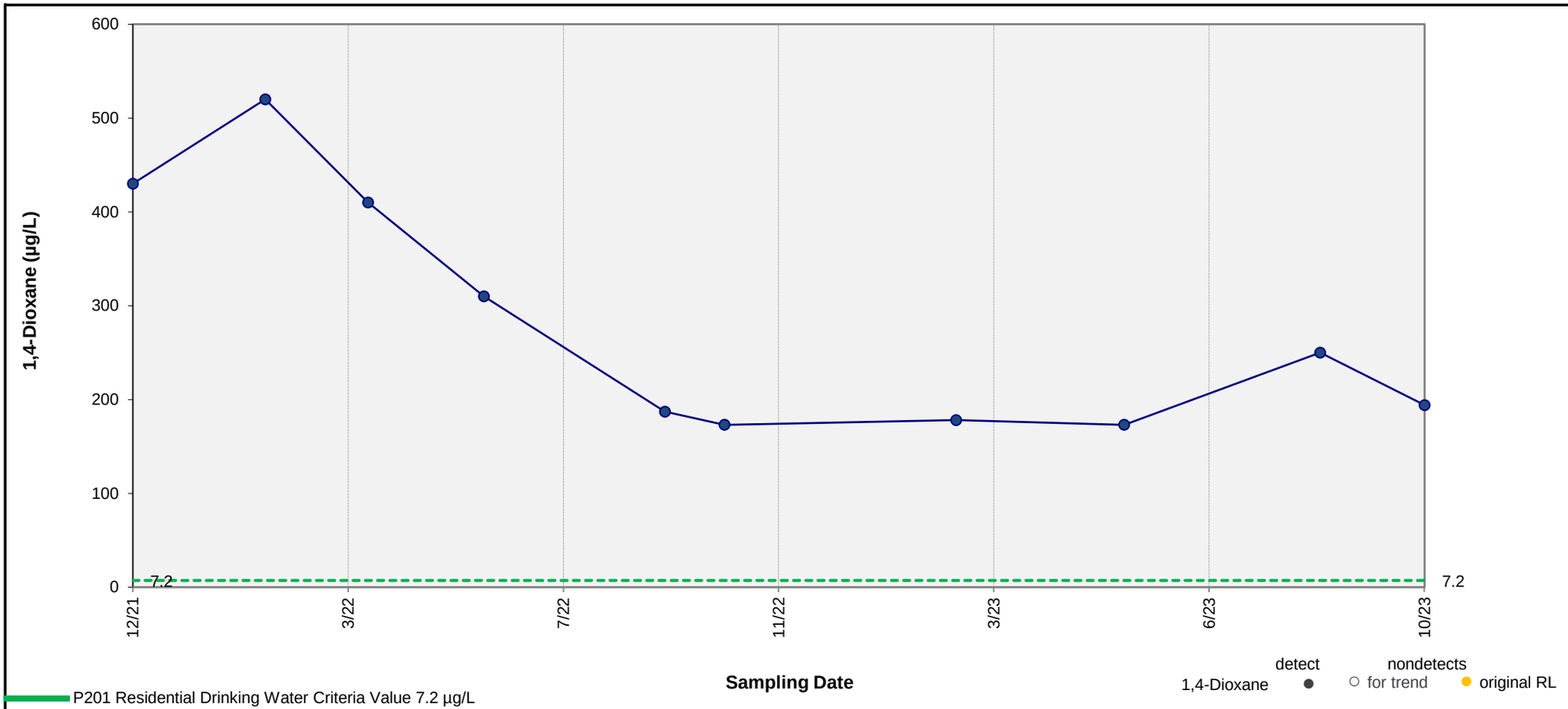
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-56

RACER Lansing

Figure F-20



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

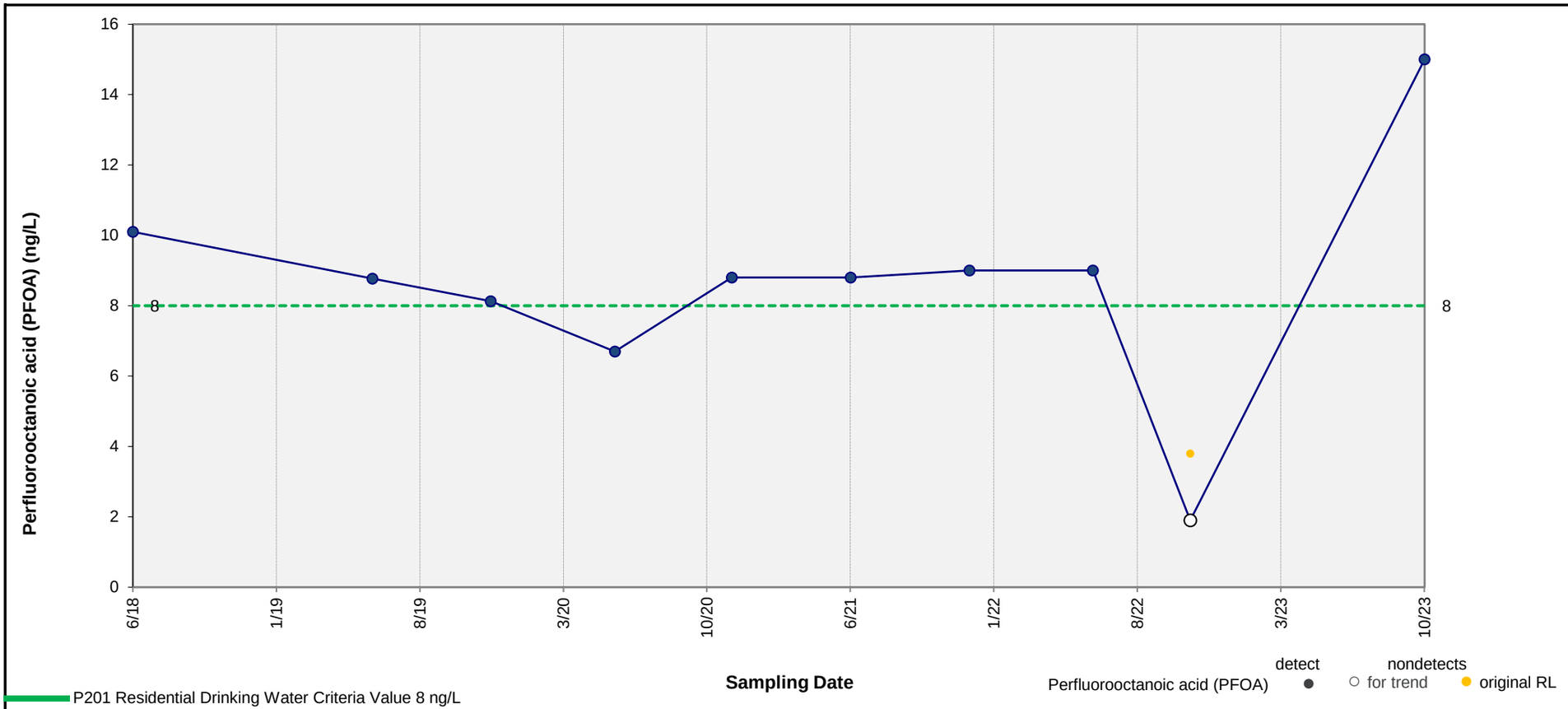
p value = 0.019 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-58R

RACER Lansing

Figure F-21



Results of Mann-Kendall Test for Trend: **No Significant Trend**

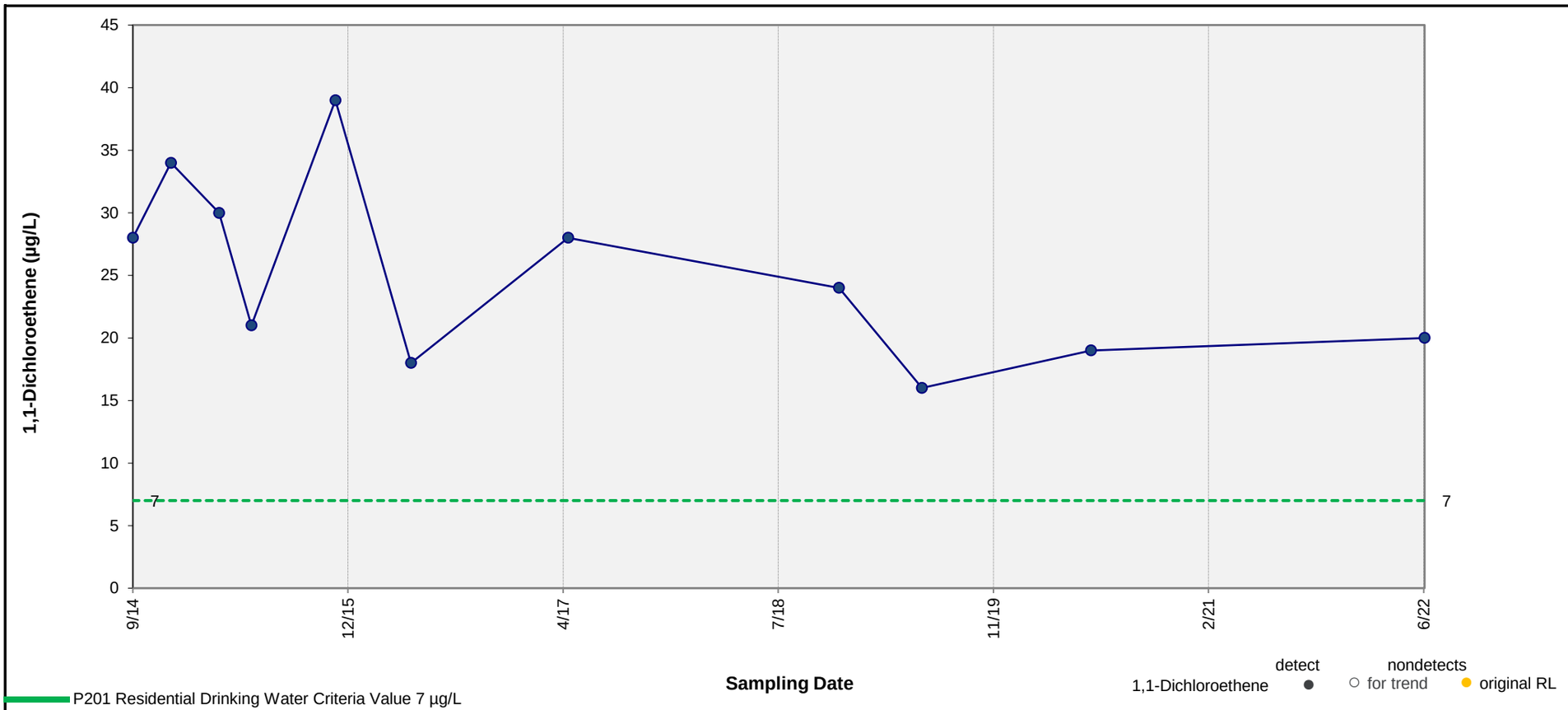
p value = 0.300 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-14-59

RACER Lansing

Figure F-22



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

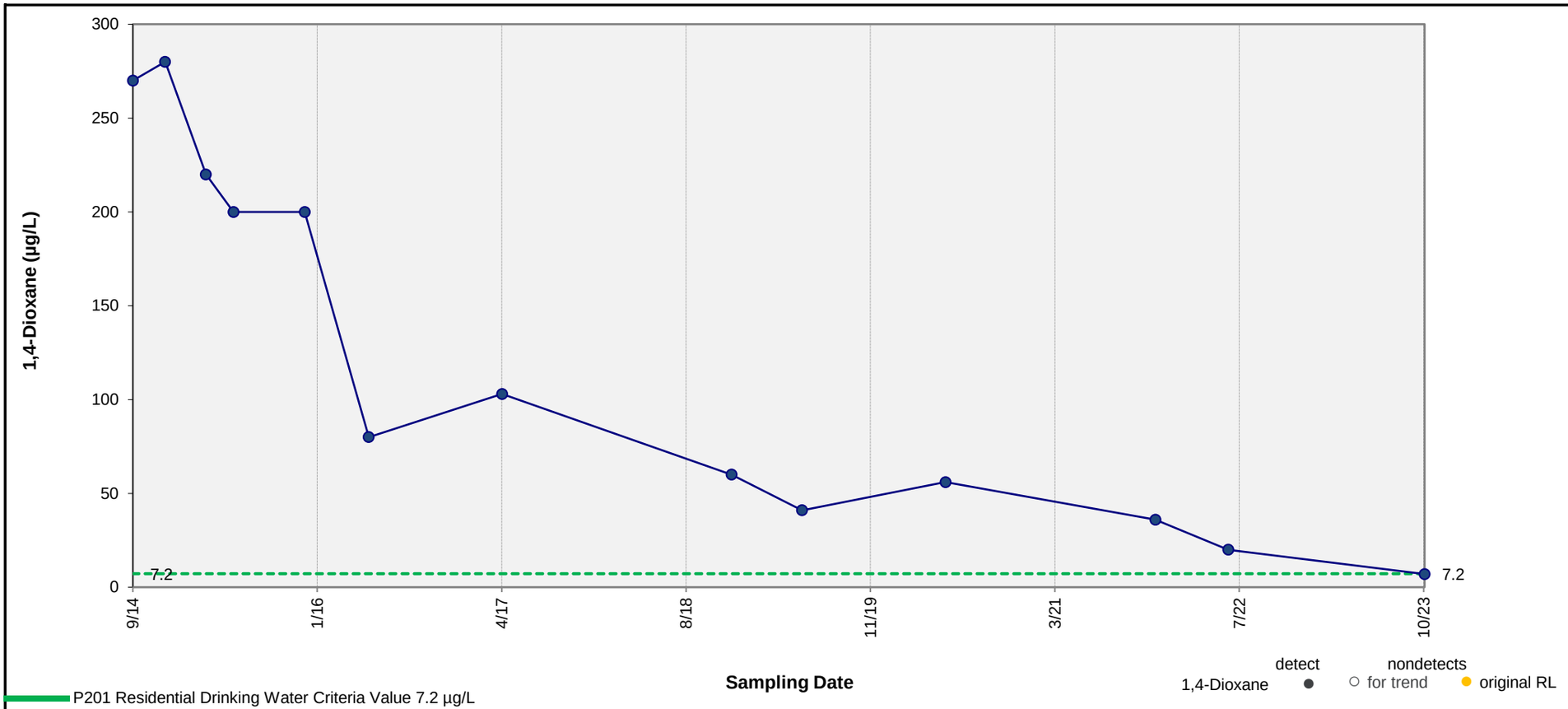
p value = 0.036 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,1-Dichloroethene in Well MW-14-59

RACER Lansing

Figure F-23



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

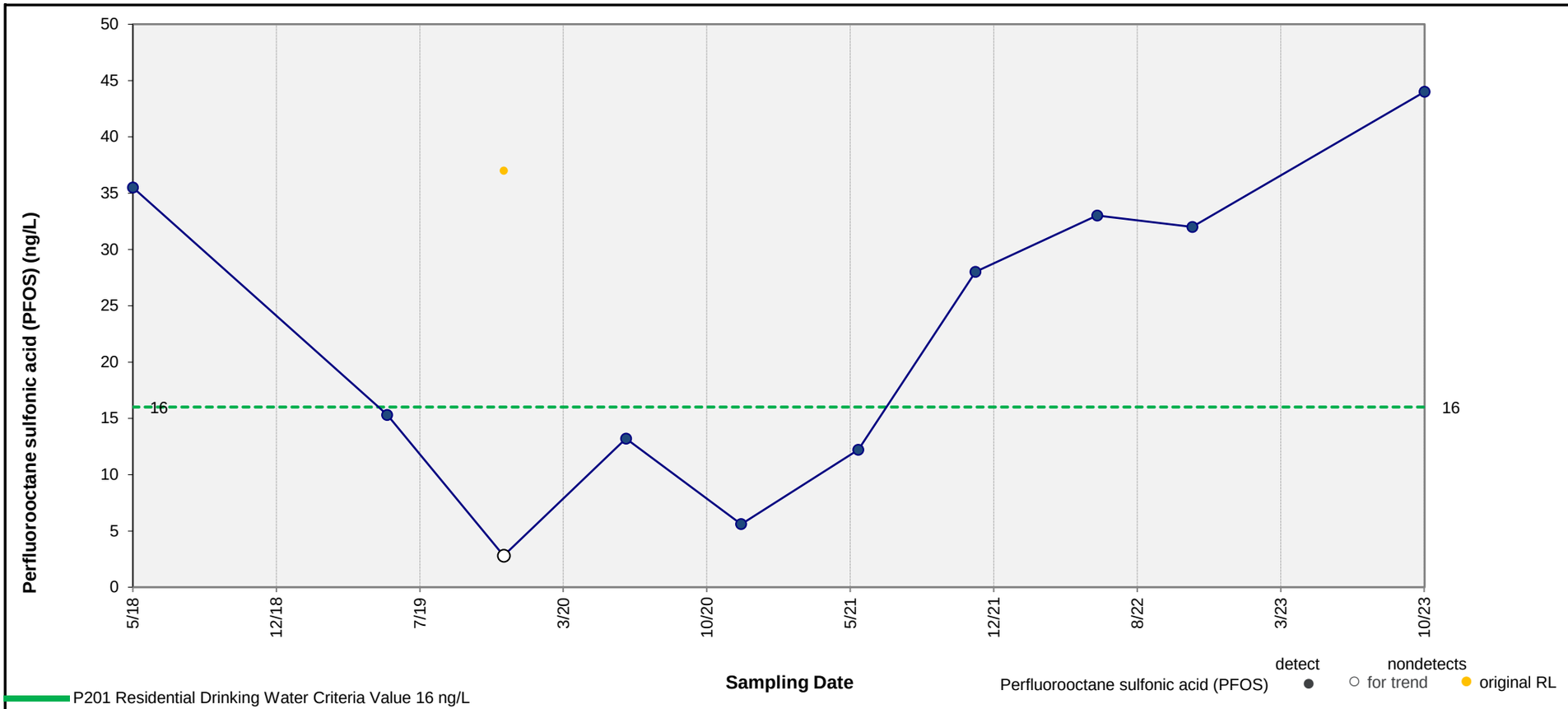
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-59

RACER Lansing

Figure F-24



Results of Mann-Kendall Test for Trend: **No Significant Trend**

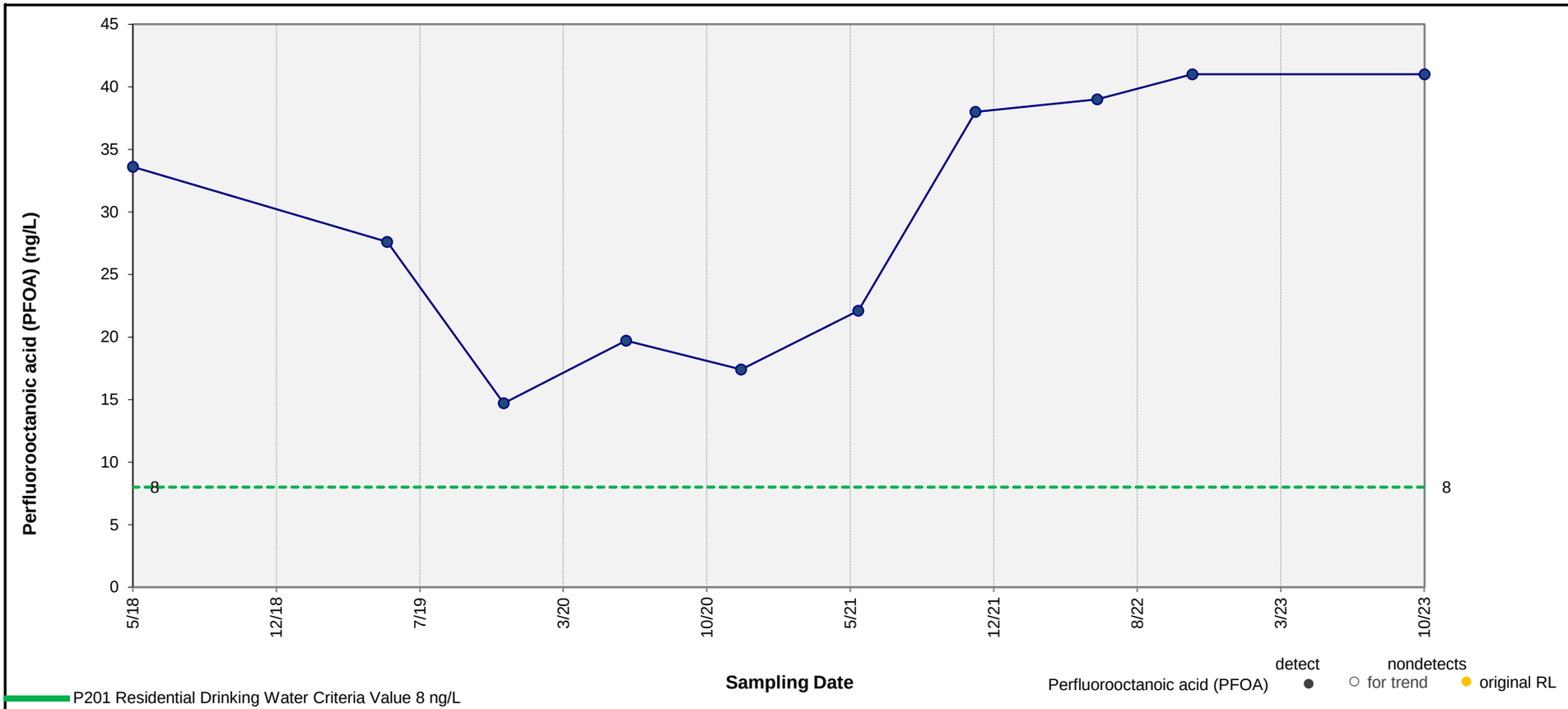
p value = 0.108 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-14-60

RACER Lansing

Figure F-25



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

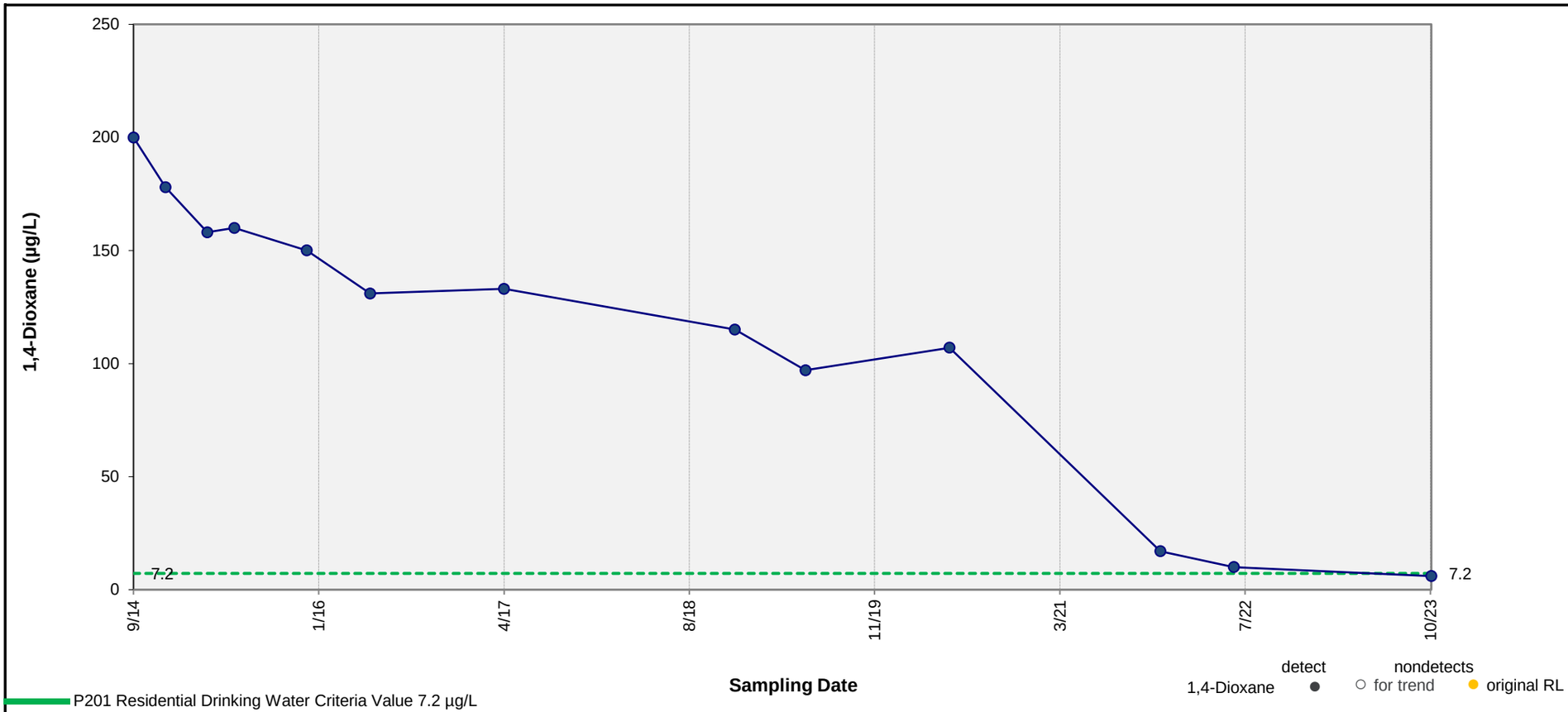
p value = 0.019 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-14-60

RACER Lansing

Figure F-26



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

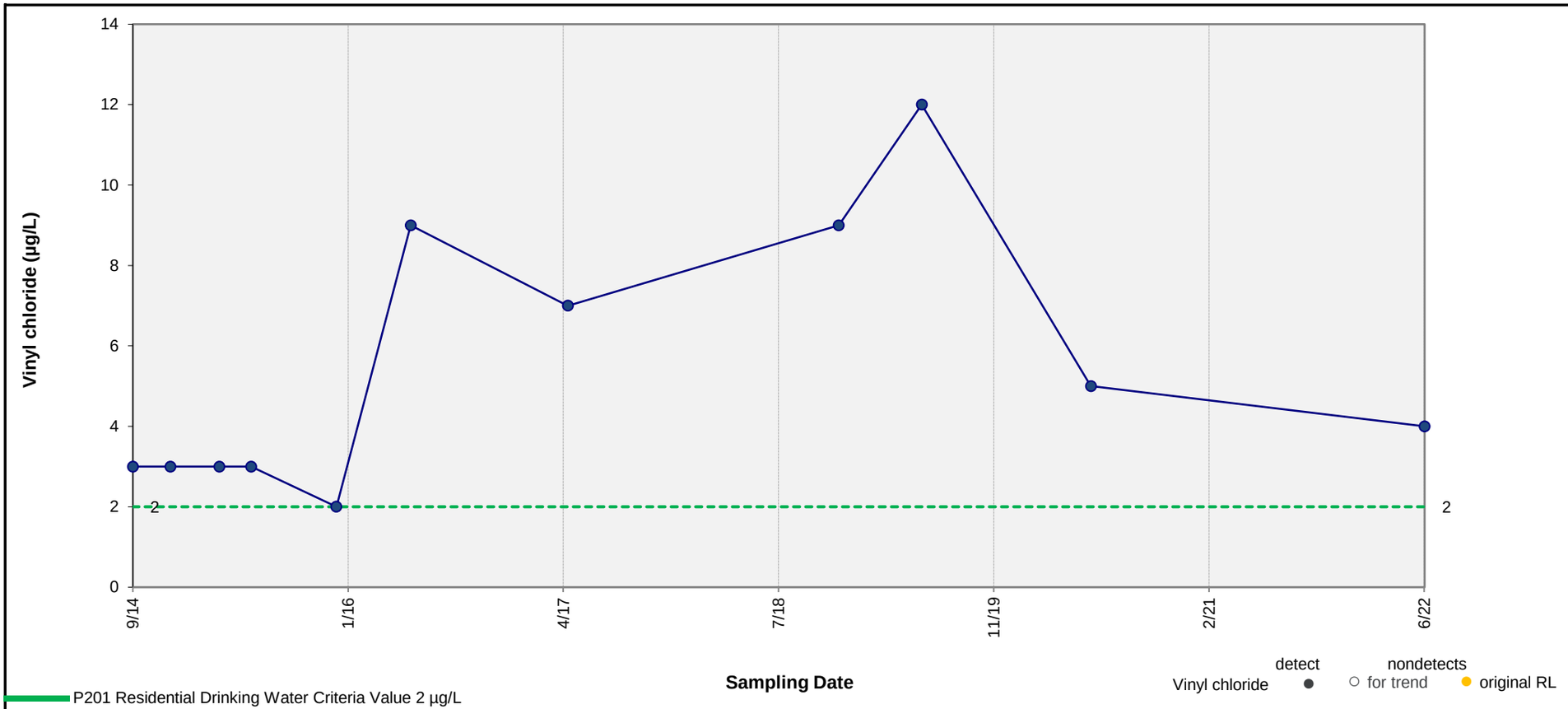
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-60

RACER Lansing

Figure F-27



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

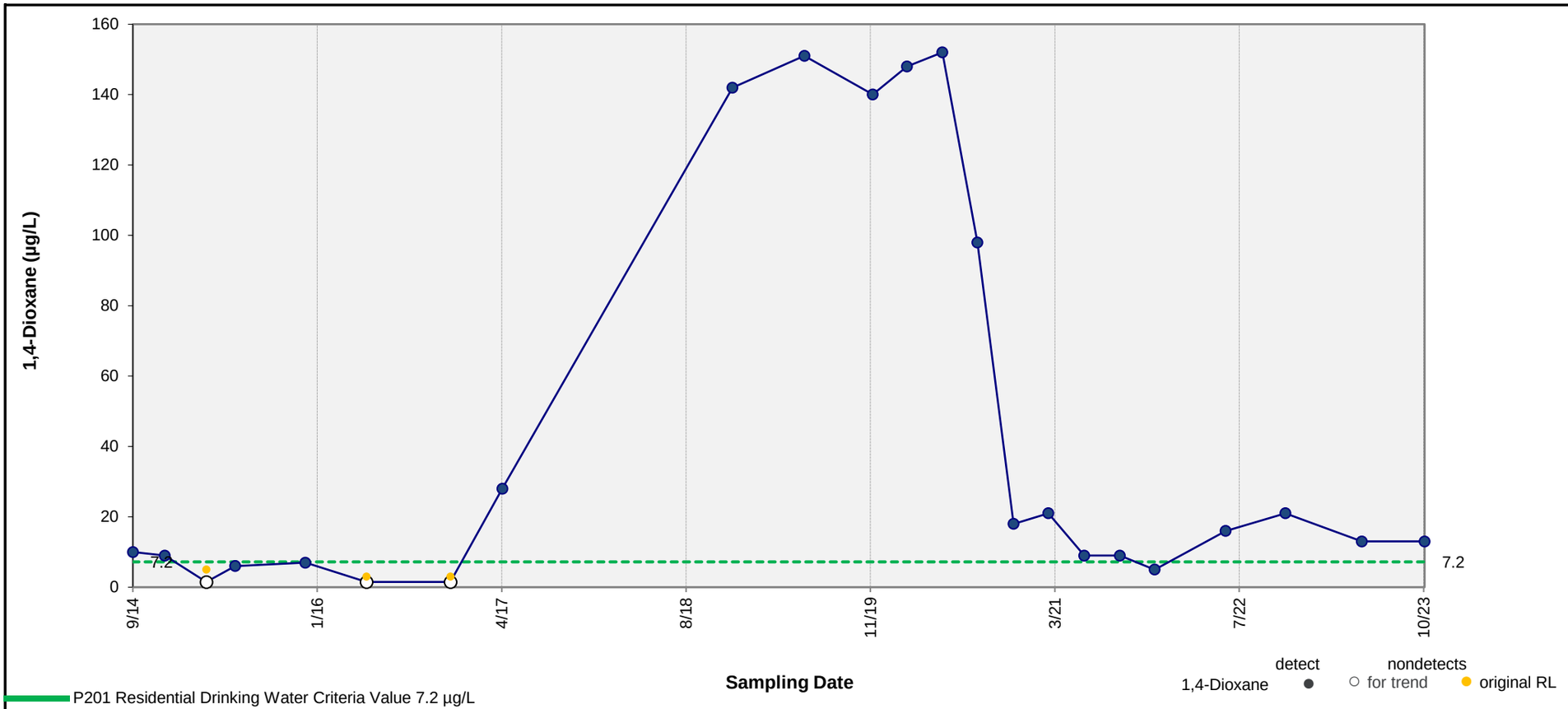
p value = 0.064 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Vinyl chloride in Well MW-14-60

RACER Lansing

Figure F-28



Results of Mann-Kendall Test for Trend: **No Significant Trend**

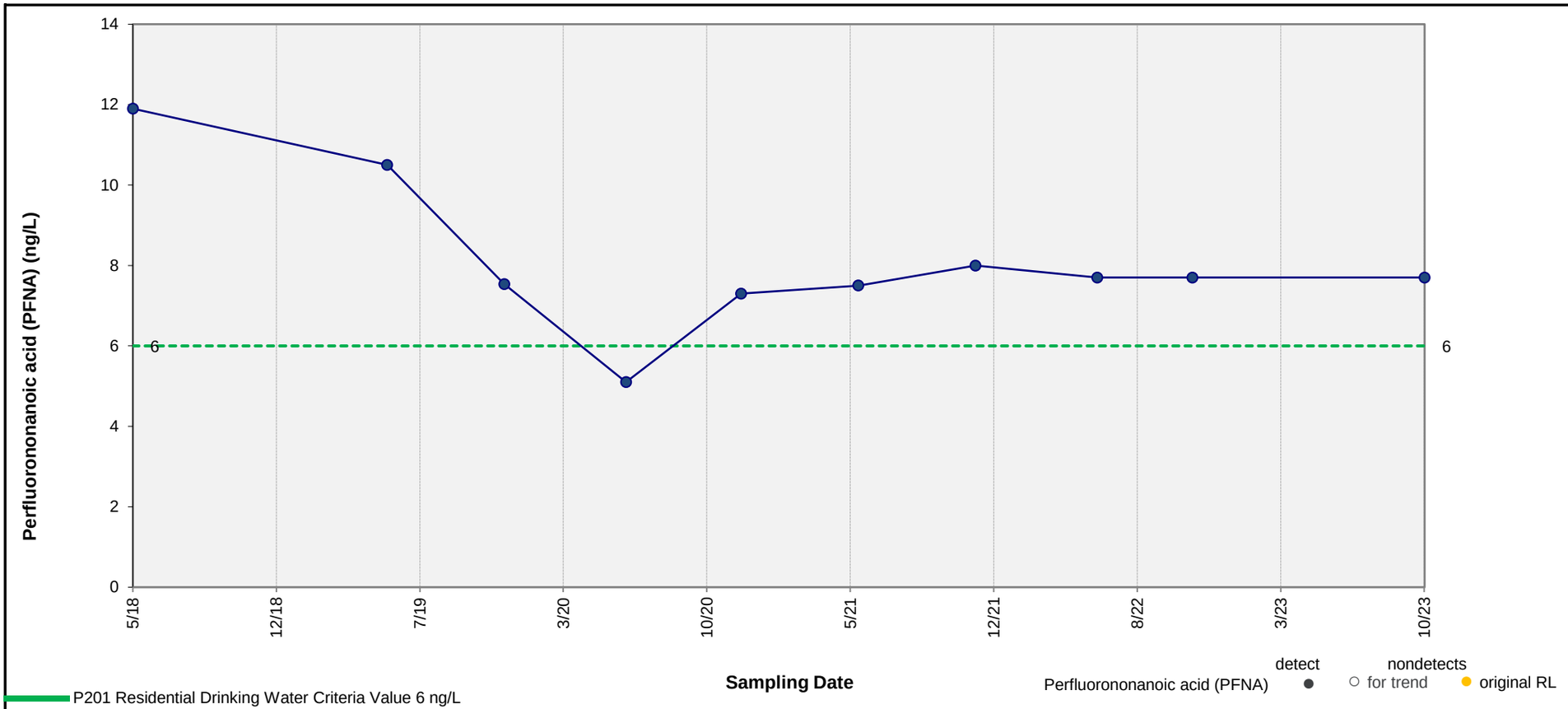
p value = 0.262 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-61

RACER Lansing

Figure F-29



Results of Mann-Kendall Test for Trend: **No Significant Trend**

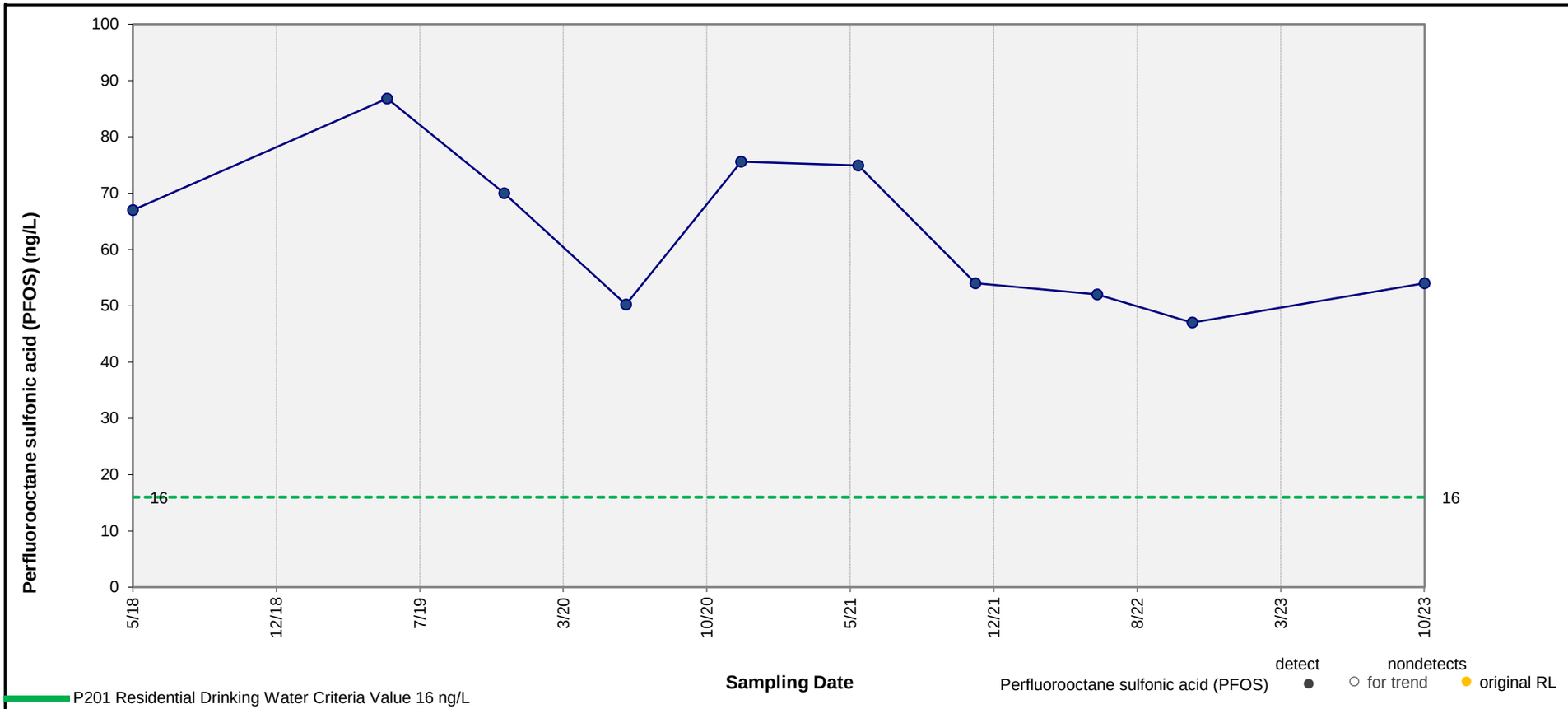
p value = 0.398 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-14-62

RACER Lansing

Figure F-30



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

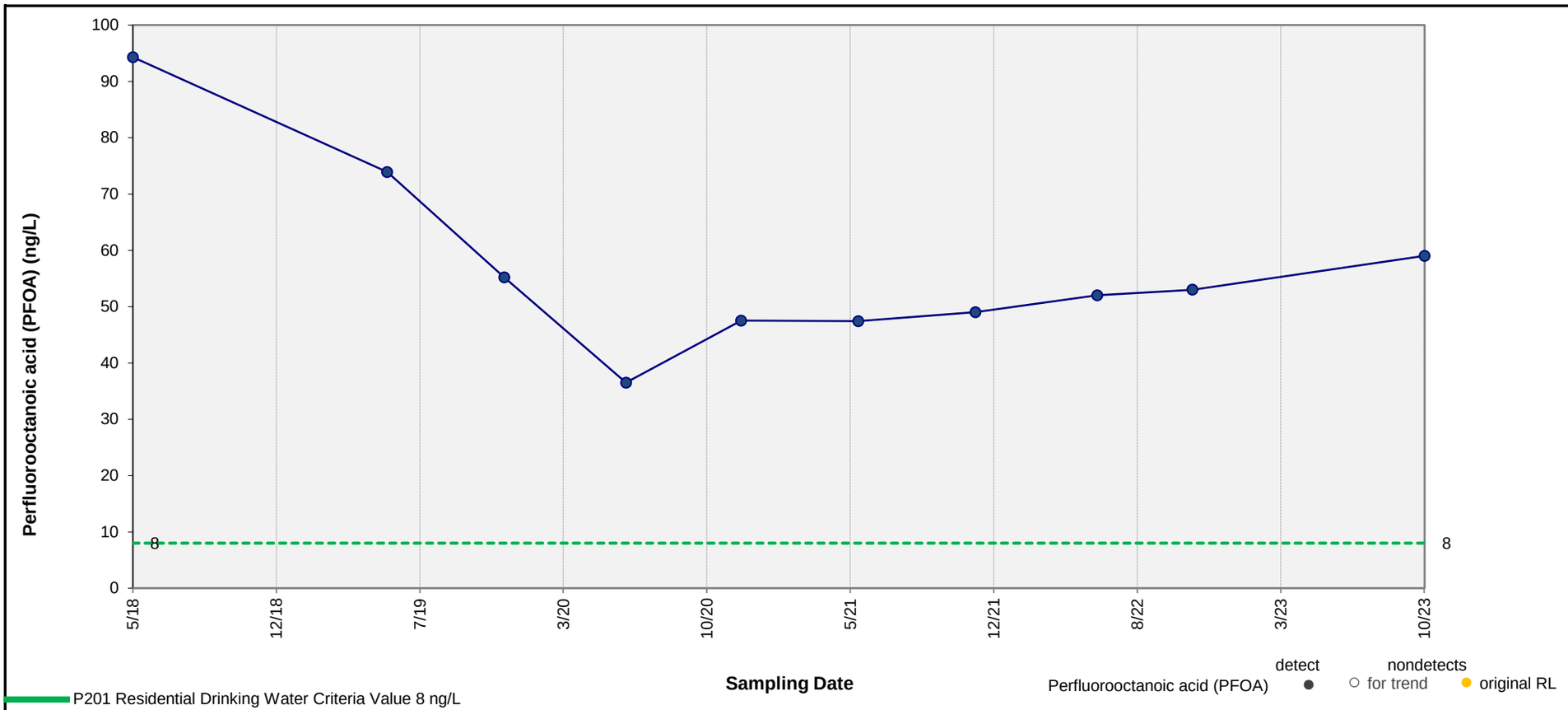
p value = 0.066 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-14-62

RACER Lansing

Figure F-31



Results of Mann-Kendall Test for Trend: **No Significant Trend**

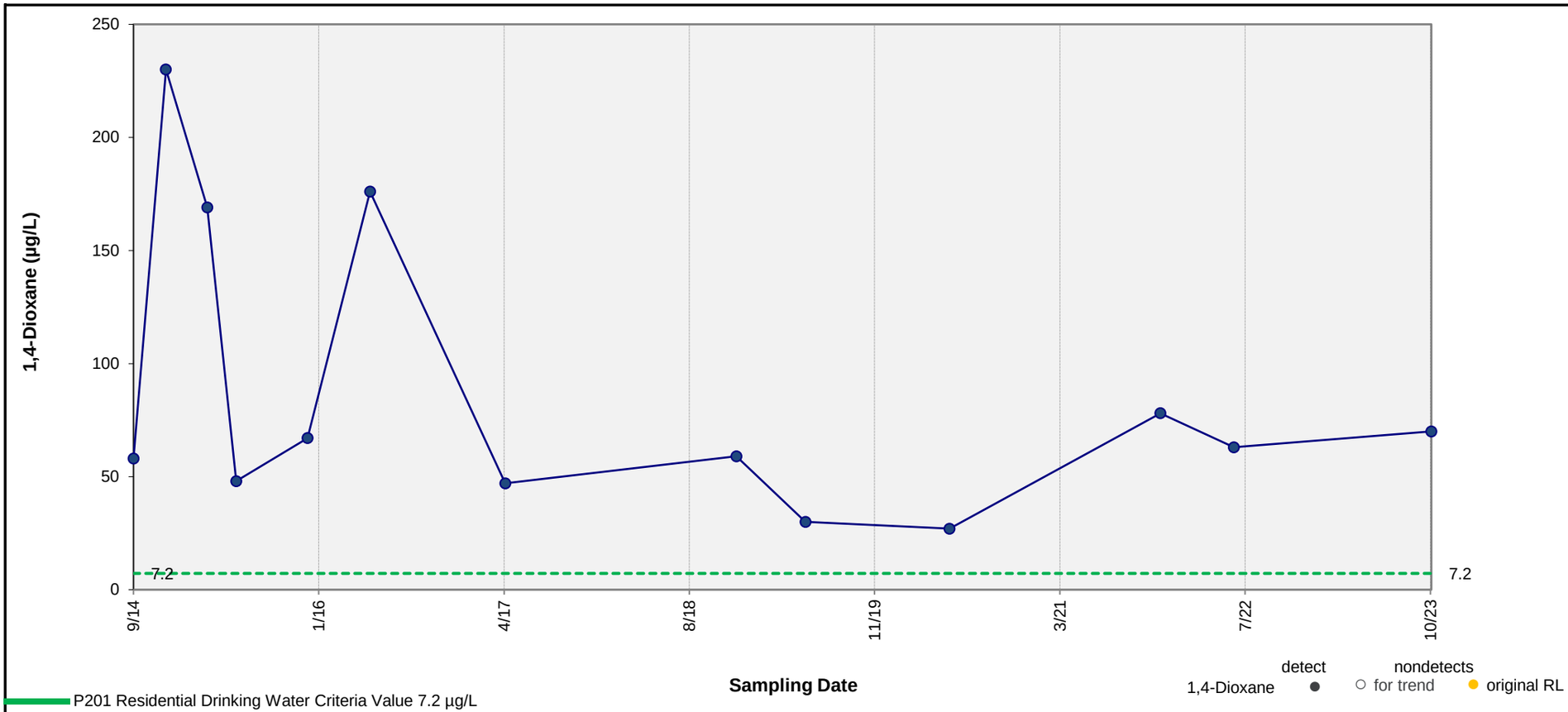
p value = 0.431 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-14-62

RACER Lansing

Figure F-32



Results of Mann-Kendall Test for Trend: **No Significant Trend**

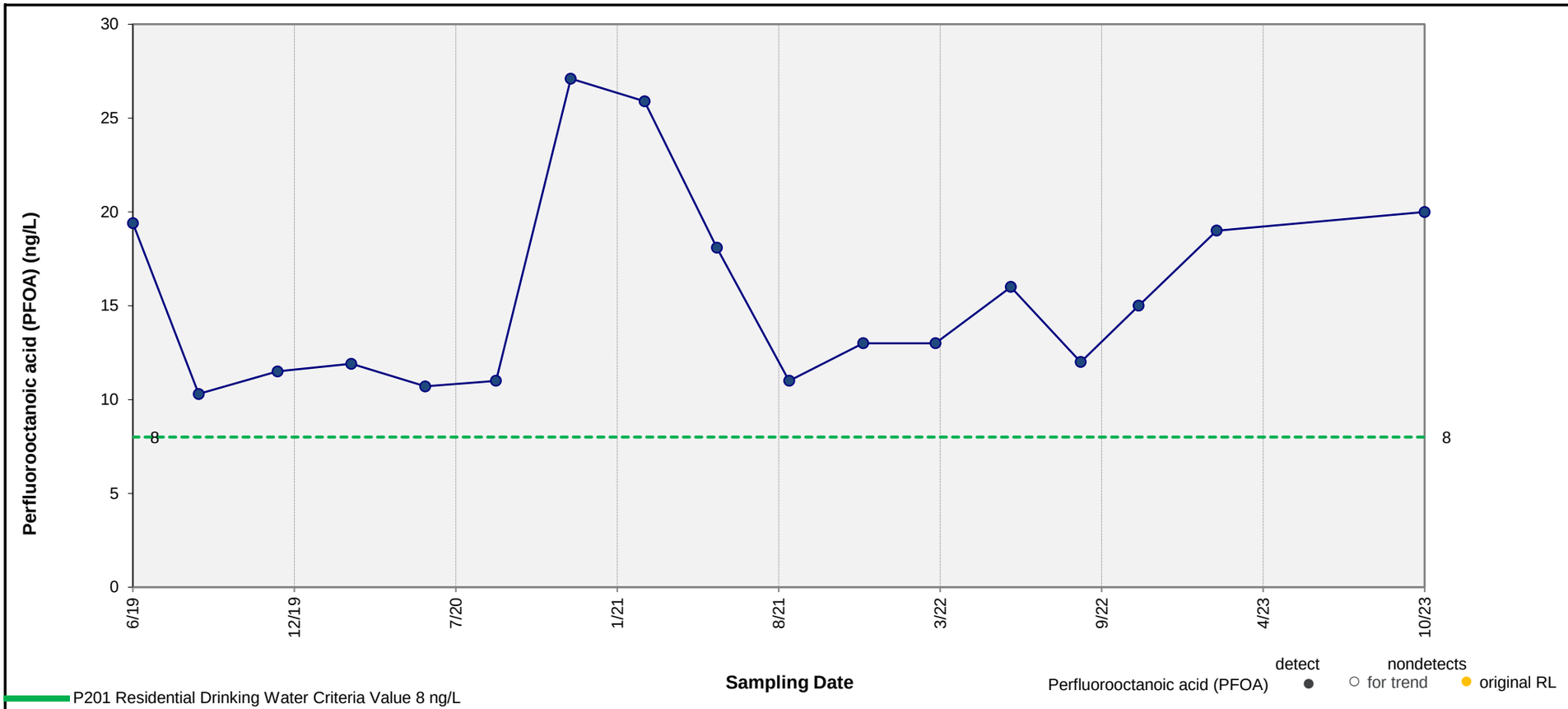
p value = 0.214 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-14-62

RACER Lansing

Figure F-33



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

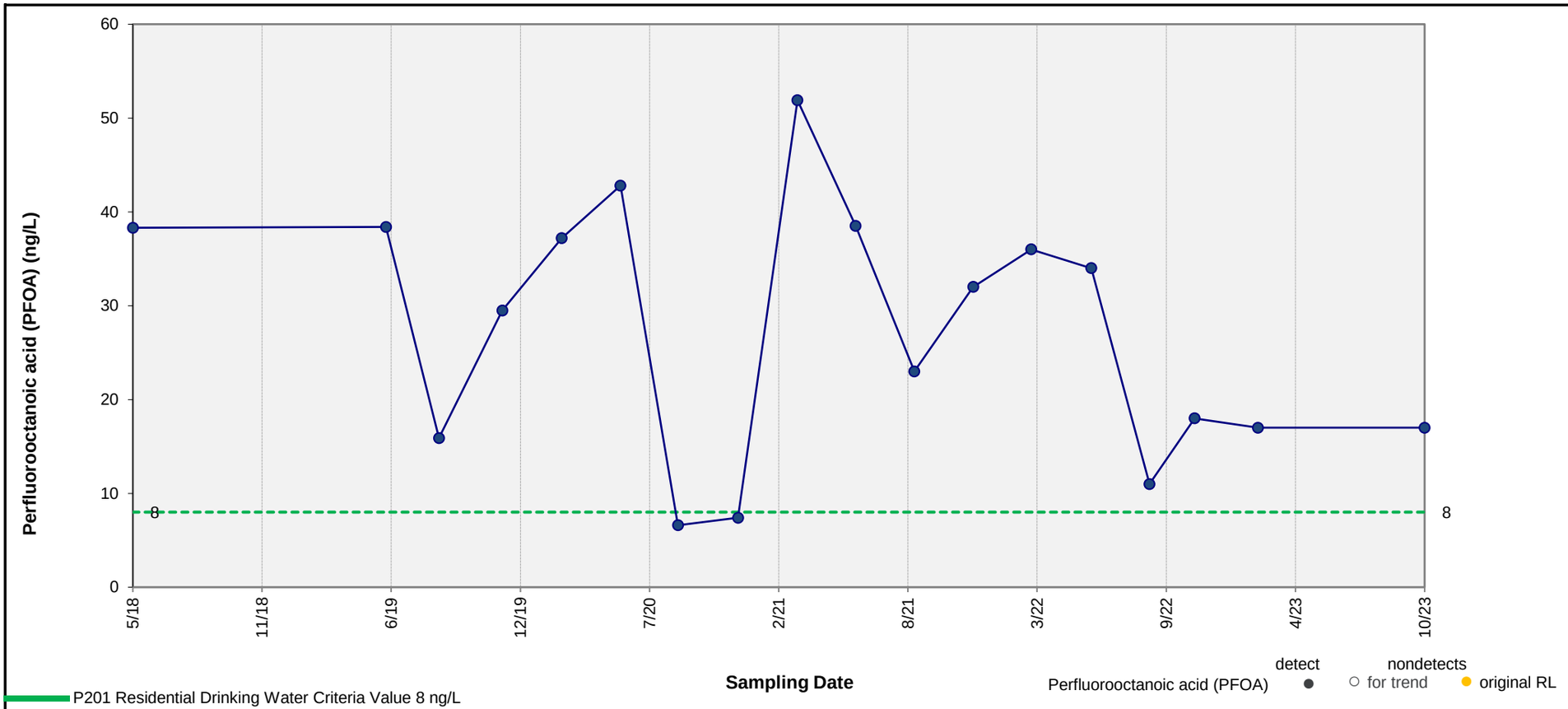
p value = 0.063 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-14-67

RACER Lansing

Figure F-34



Results of Mann-Kendall Test for Trend: **No Significant Trend**

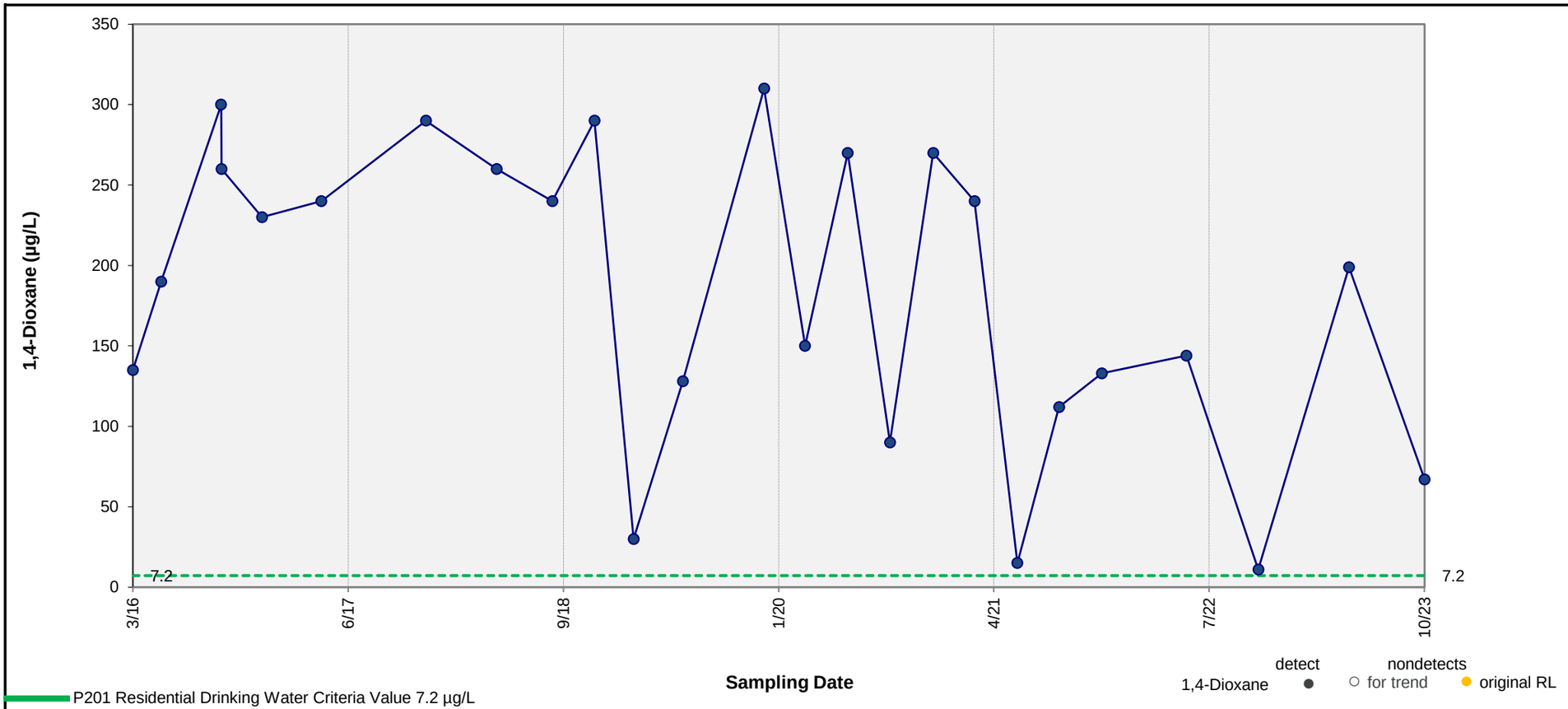
p value = 0.105 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-14-70

RACER Lansing

Figure F-35



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

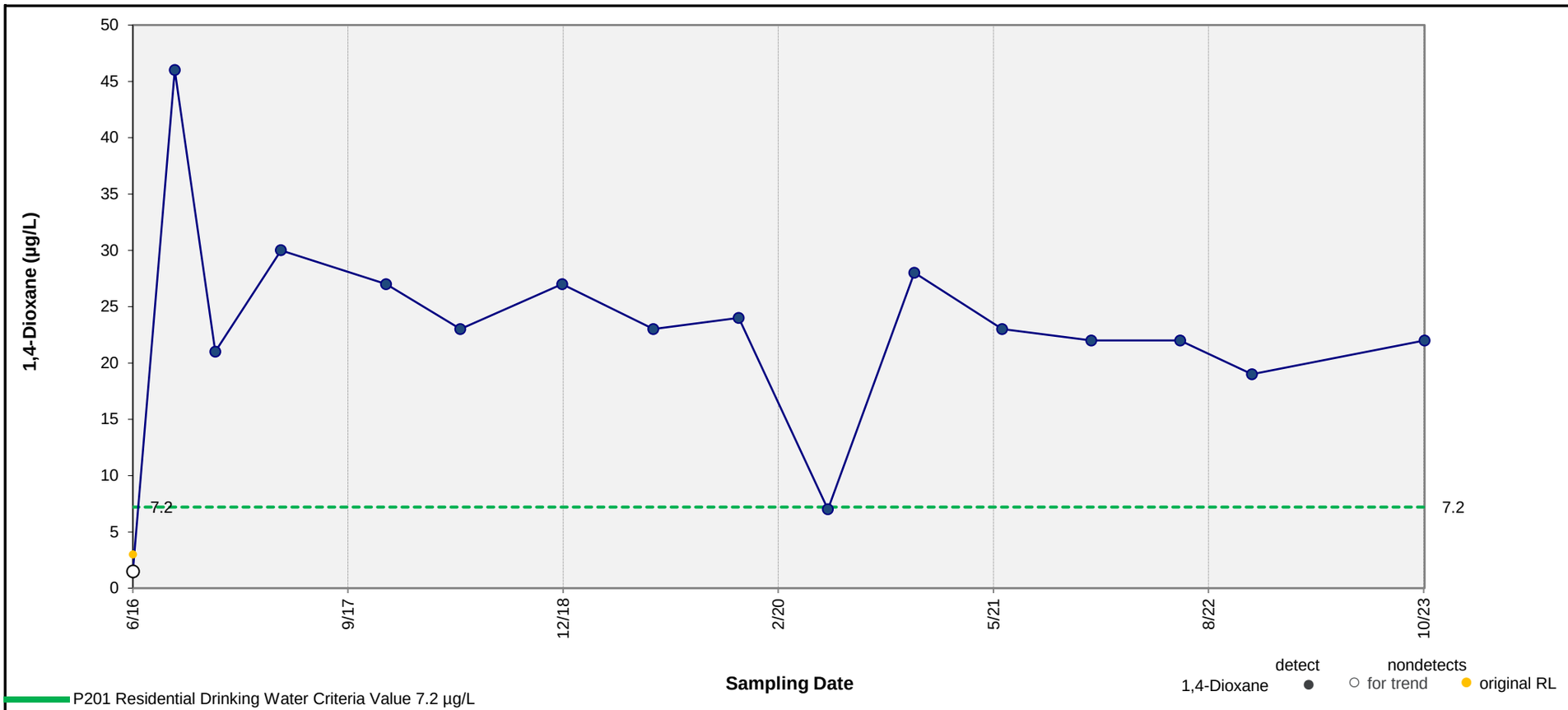
p value = 0.021 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-15-72

RACER Lansing

Figure F-36



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

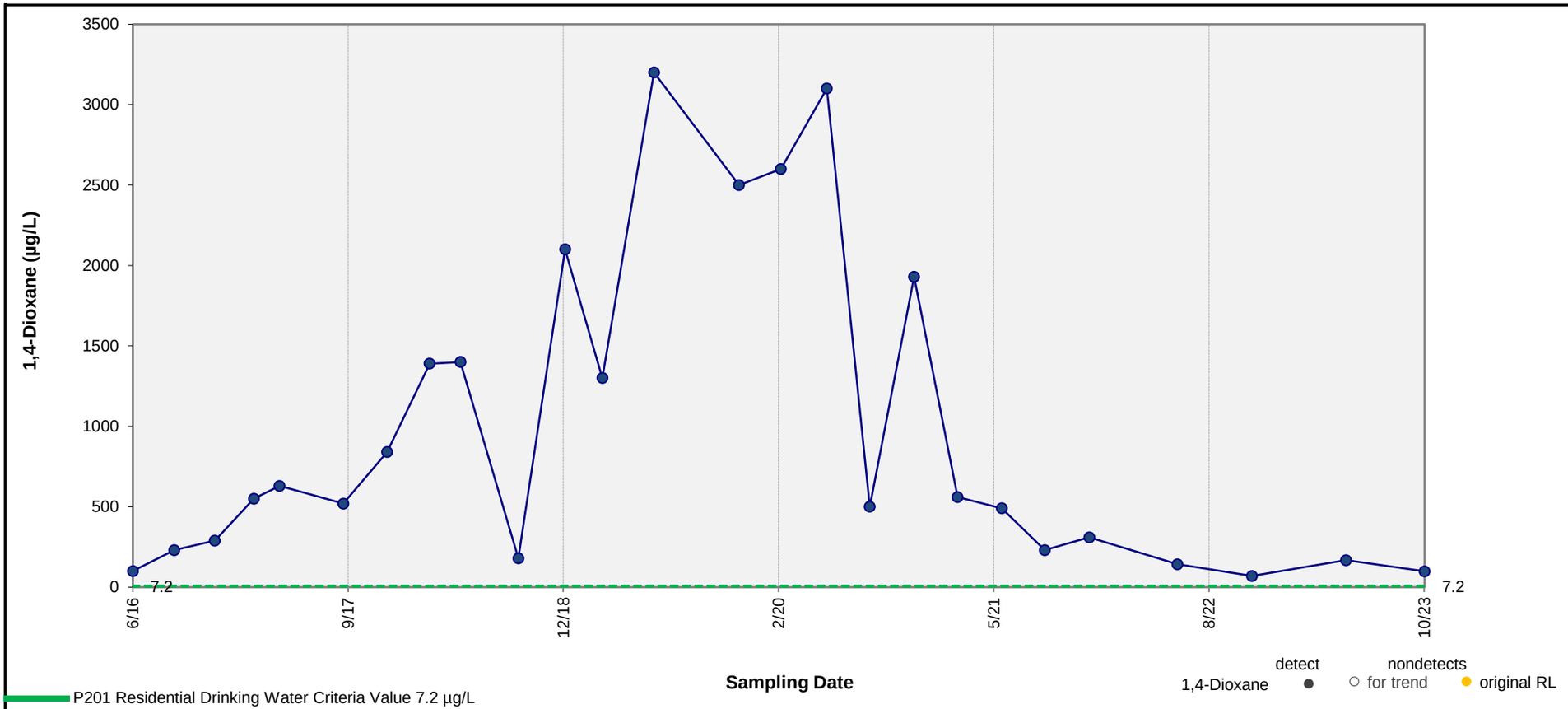
p value = 0.087 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-16-80

RACER Lansing

Figure F-37



Results of Mann-Kendall Test for Trend: **No Significant Trend**

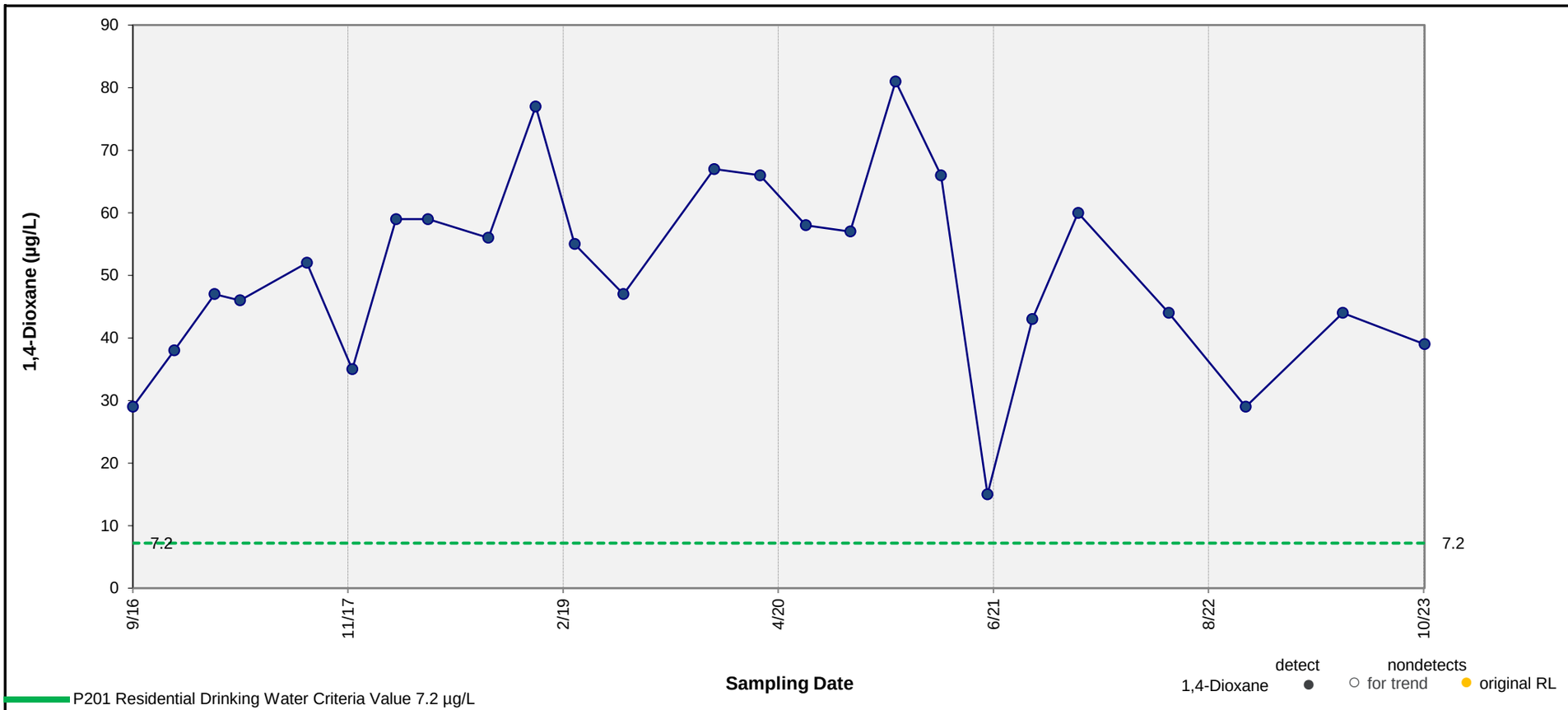
p value = 0.207 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-16-81

RACER Lansing

Figure F-38



Results of Mann-Kendall Test for Trend: **No Significant Trend**

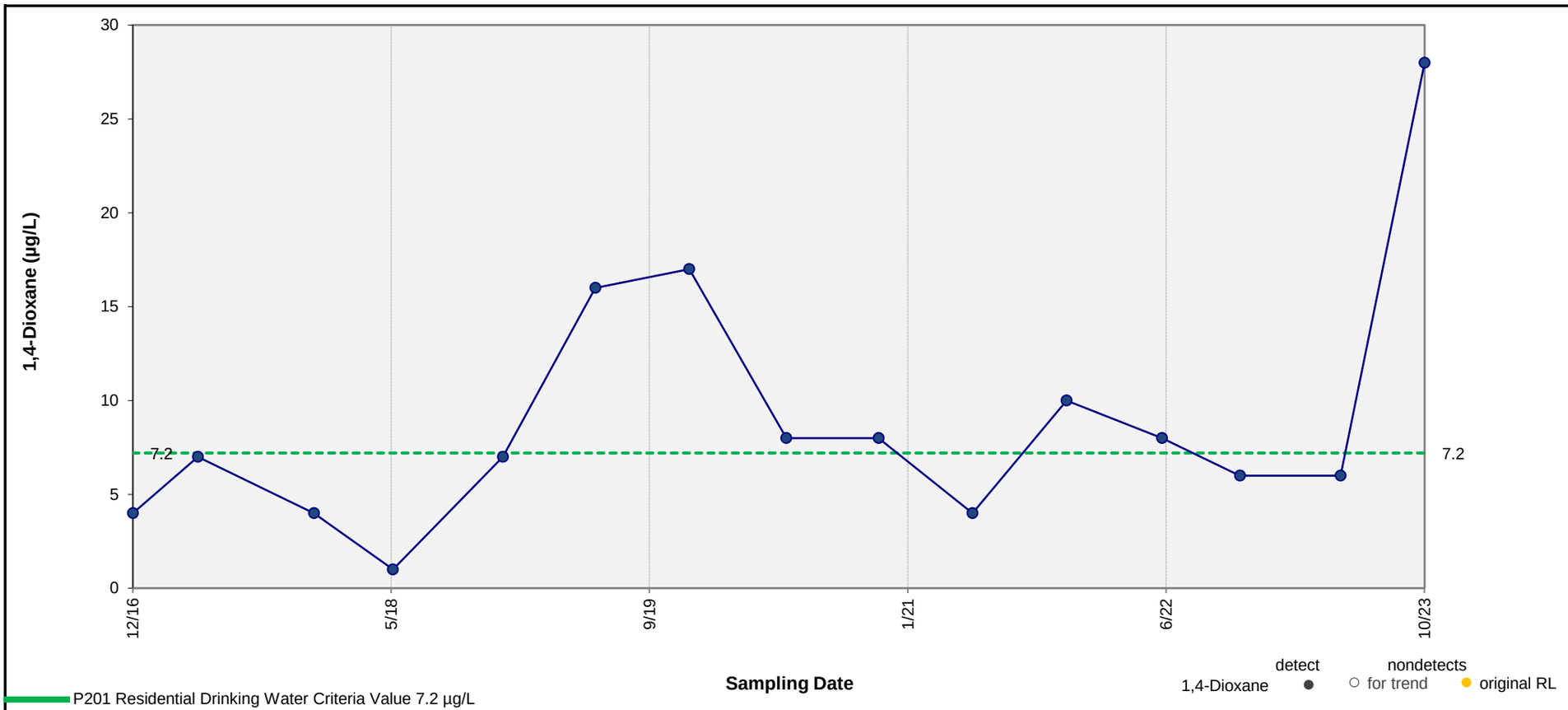
p value = 0.426 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-16-84

RACER Lansing

Figure F-39



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

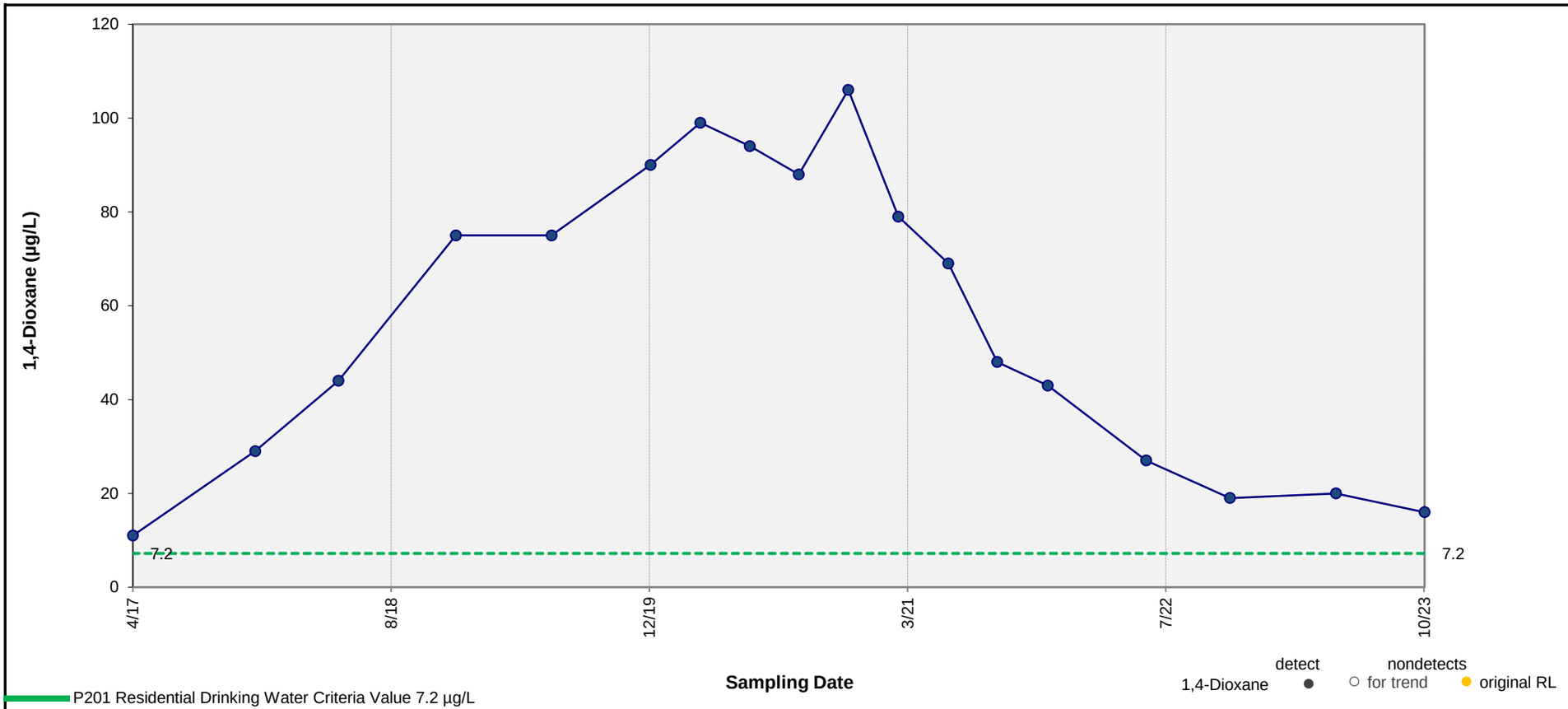
p value = 0.097 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-16-85

RACER Lansing

Figure F-40



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

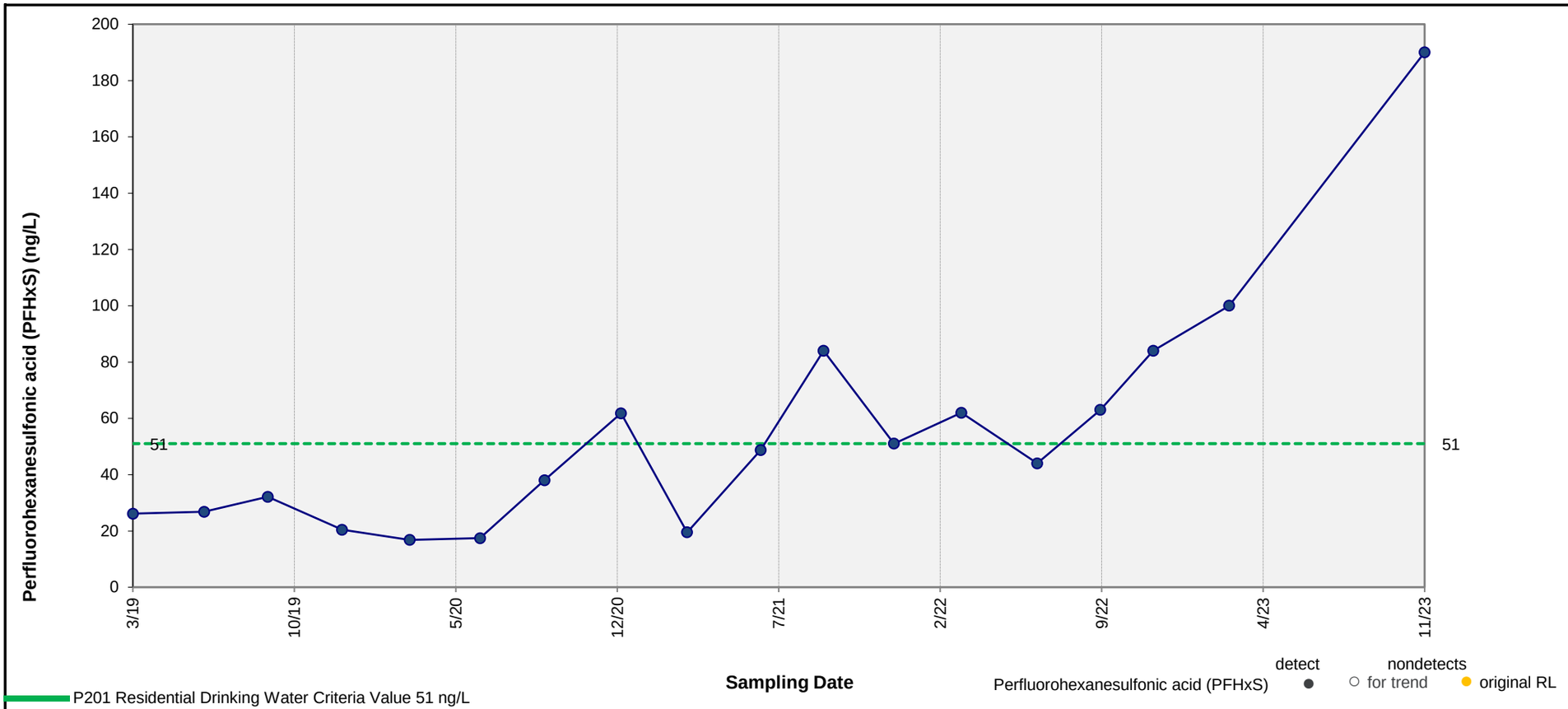
p value = 0.092 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-17-86

RACER Lansing

Figure F-41



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

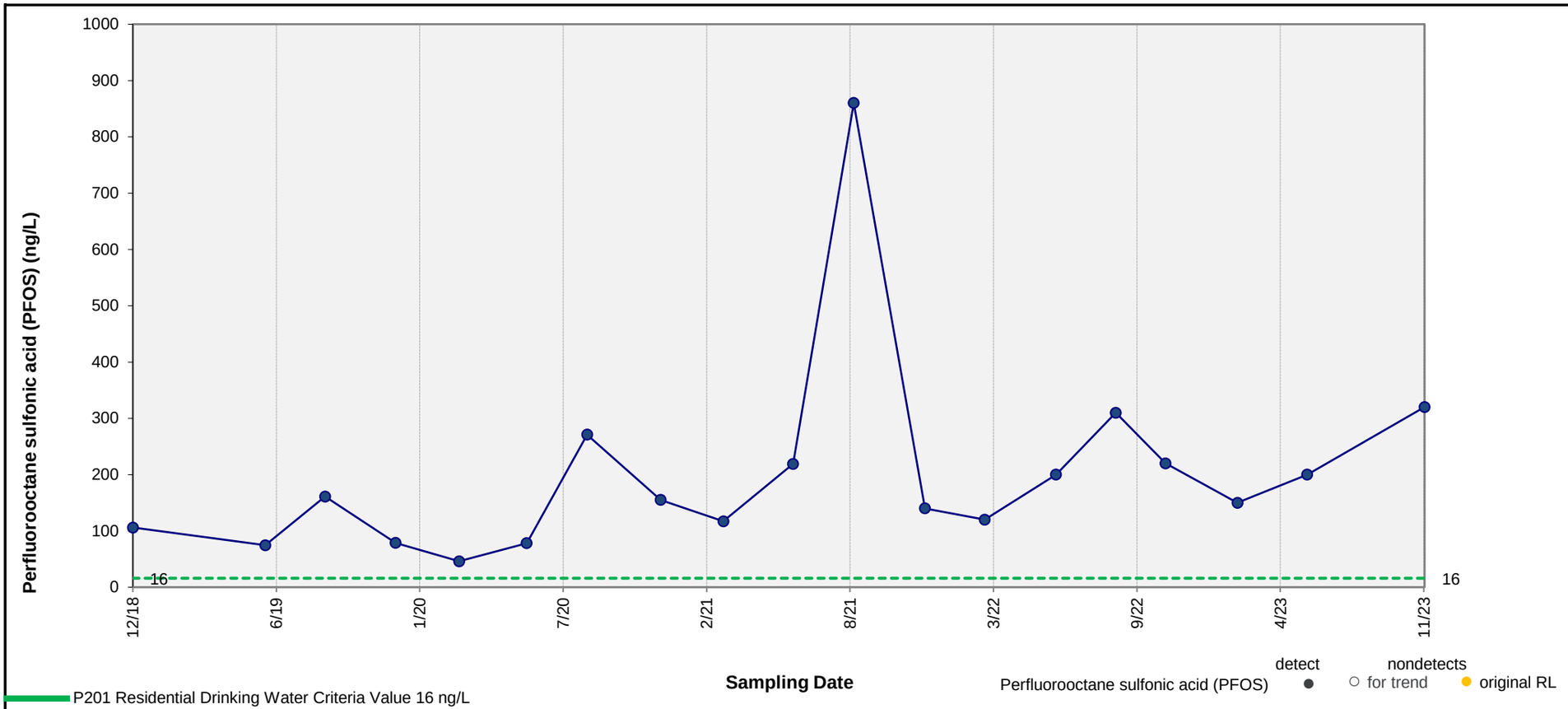
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorohexanesulfonic acid (PFHxS) in Well MW-18-103

RACER Lansing

Figure F-42



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

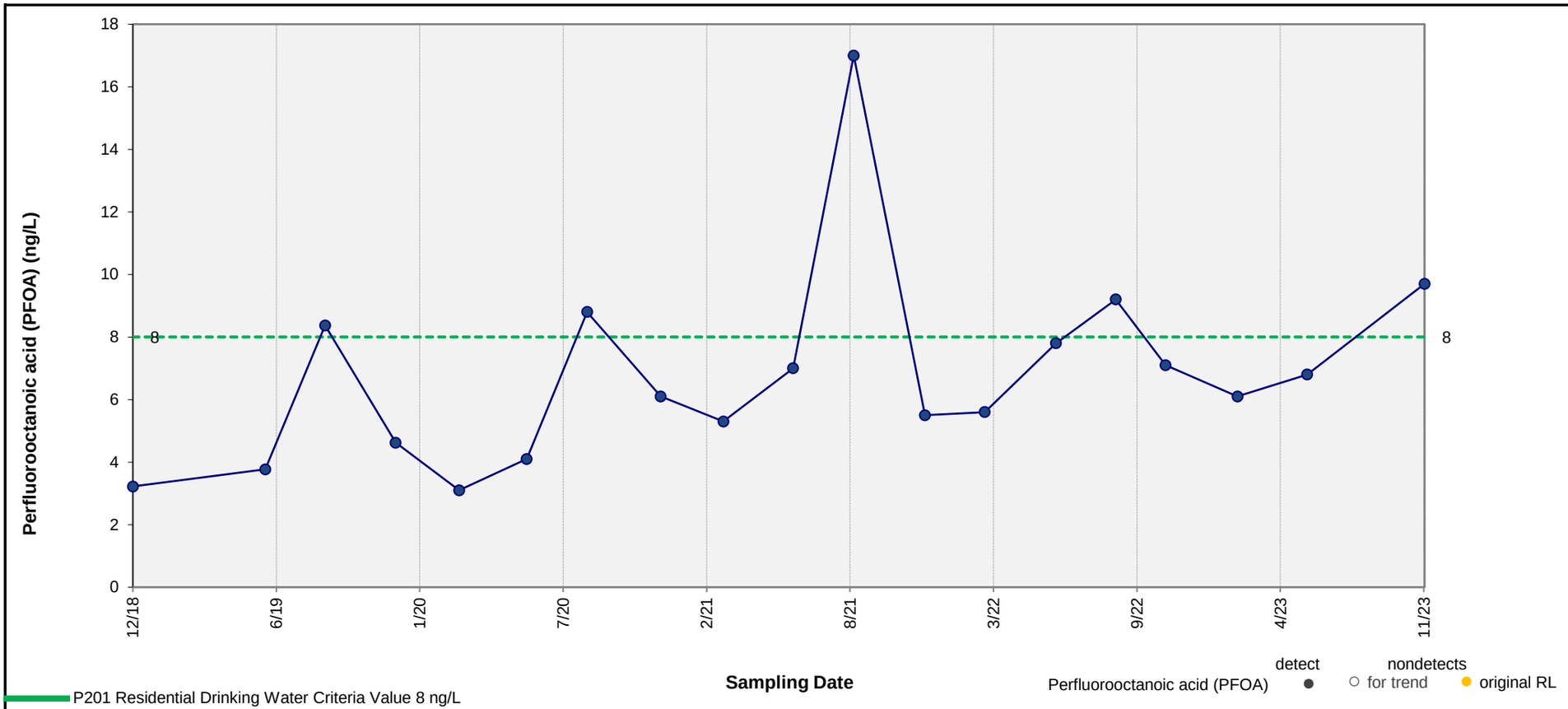
p value = 0.005 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-88

RACER Lansing

Figure F-43



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

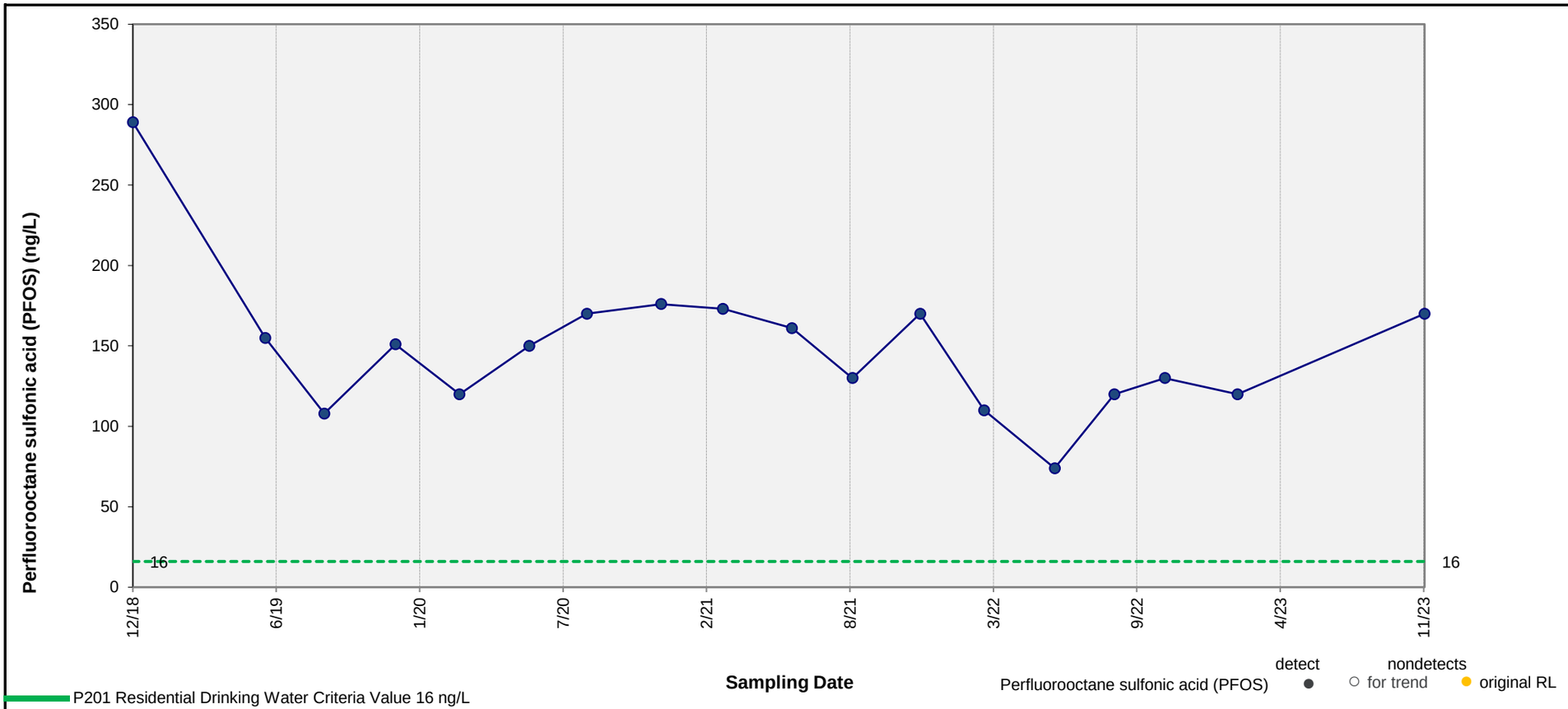
p value = 0.005 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-18-88

RACER Lansing

Figure F-44



Results of Mann-Kendall Test for Trend: **No Significant Trend**

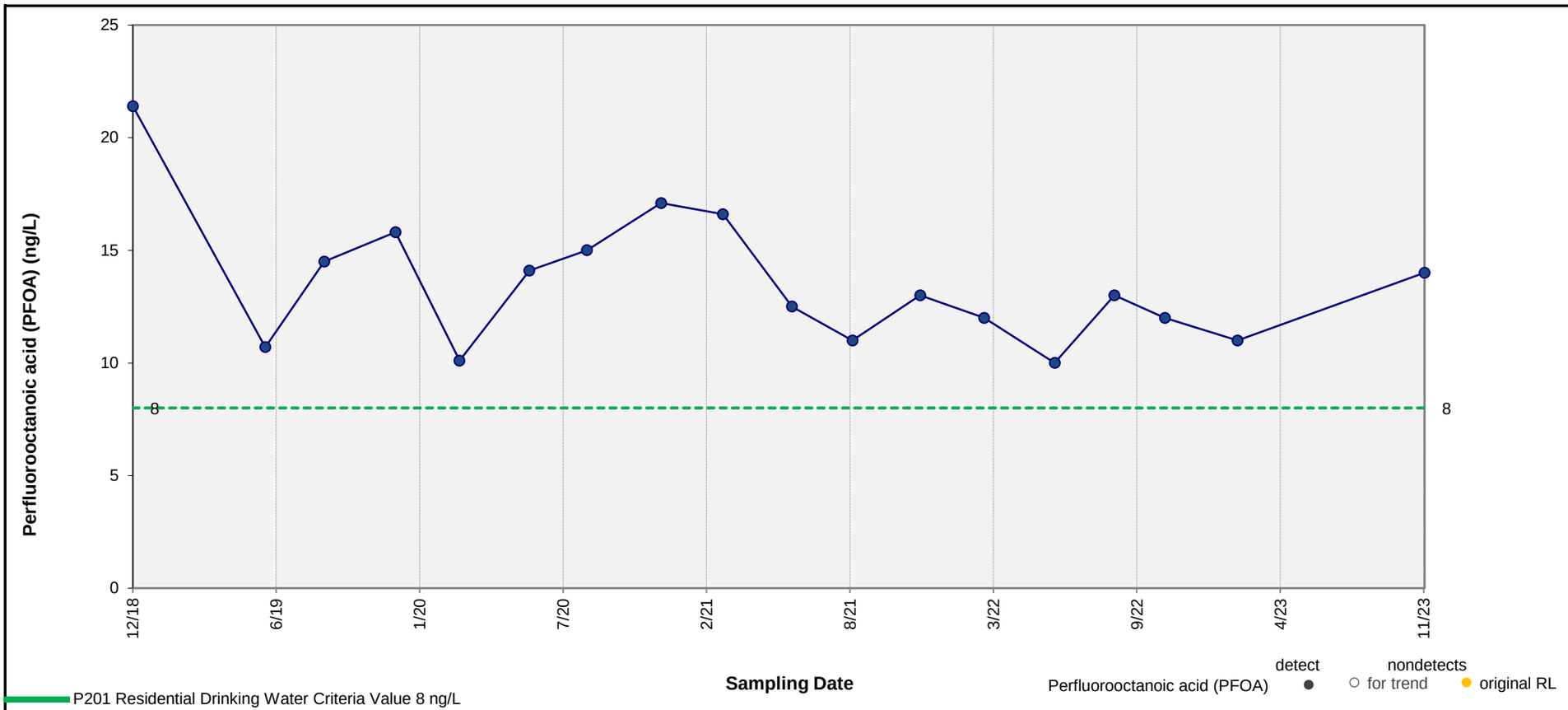
p value = 0.152 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-89

RACER Lansing

Figure F-45



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

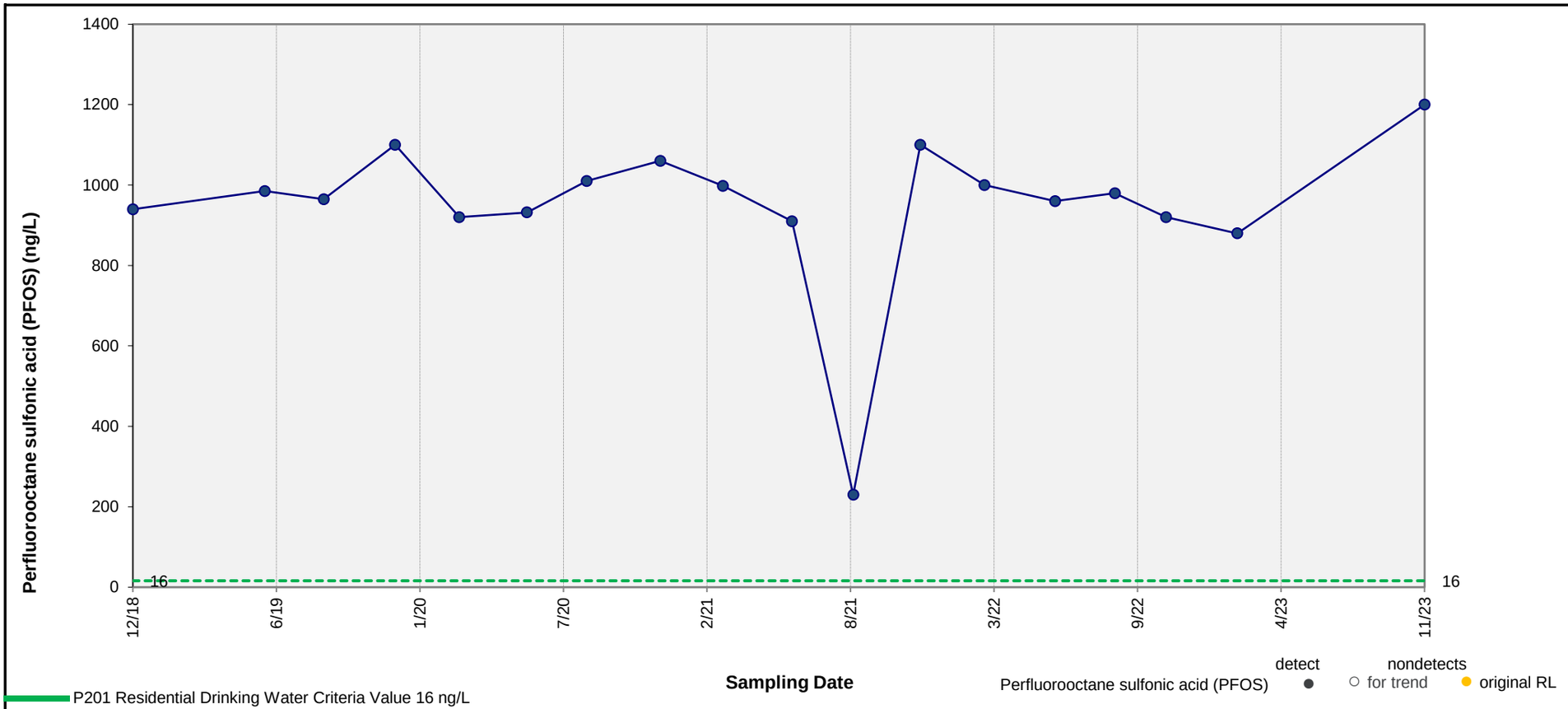
p value = 0.069 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-18-89

RACER Lansing

Figure F-46



Results of Mann-Kendall Test for Trend: **No Significant Trend**

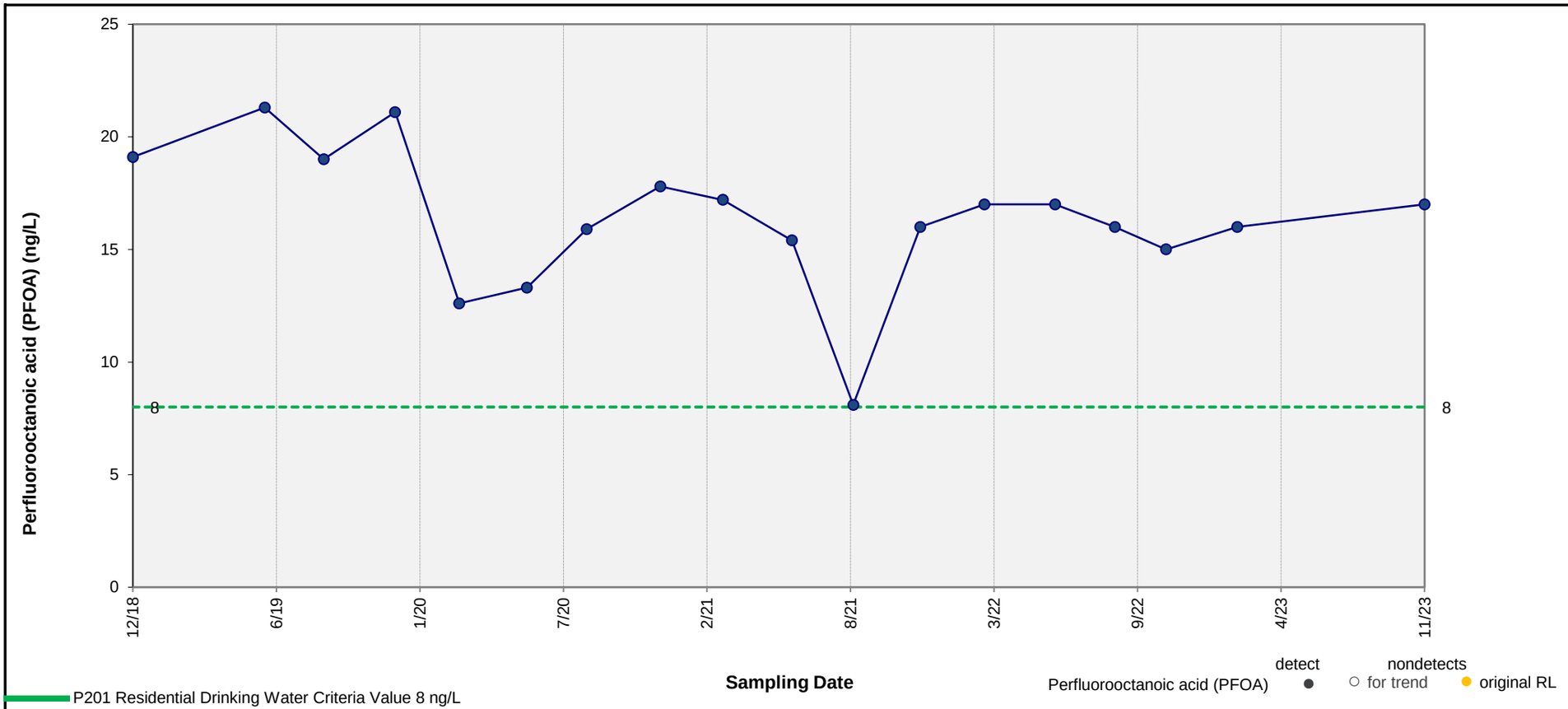
p value = 0.410 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-90

RACER Lansing

Figure F-47



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

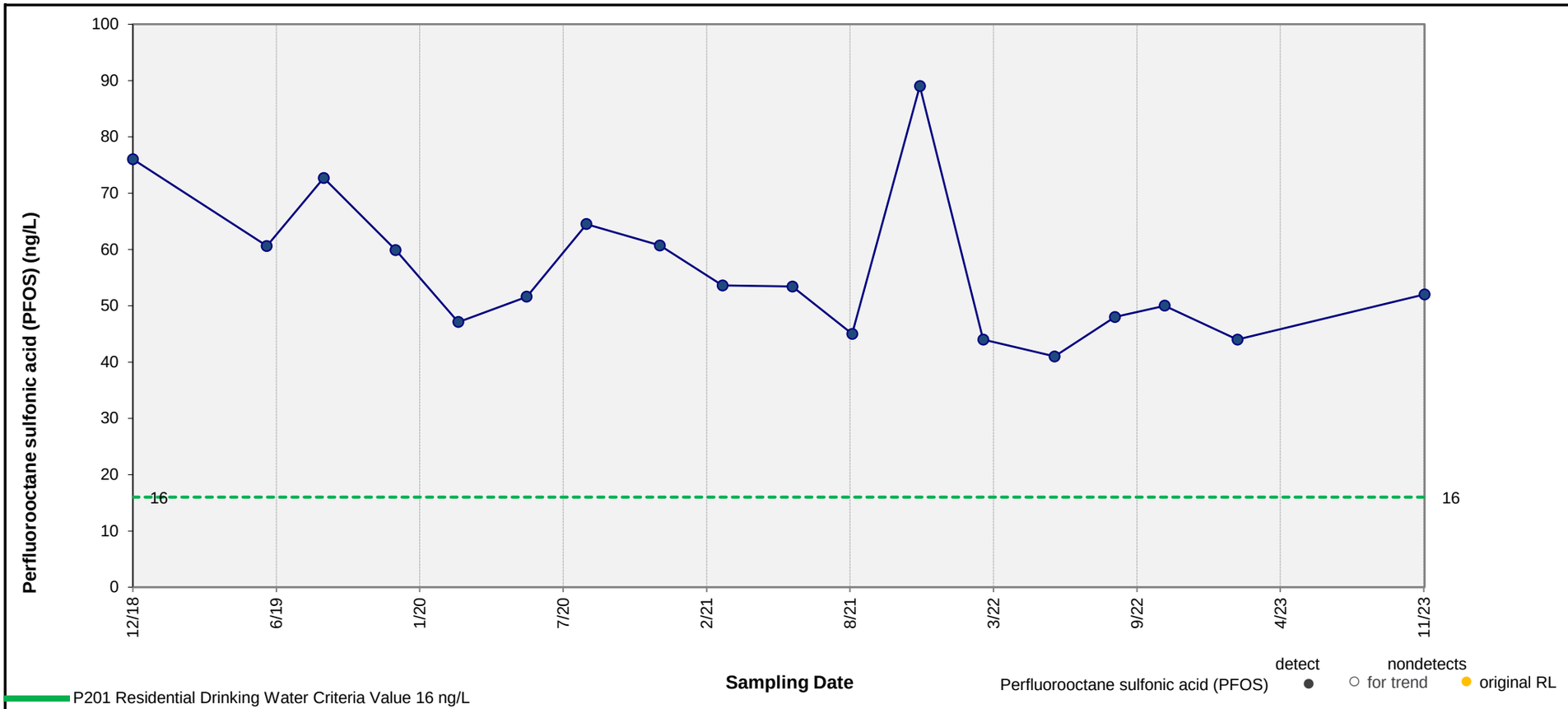
p value = 0.074 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-18-90

RACER Lansing

Figure F-48



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

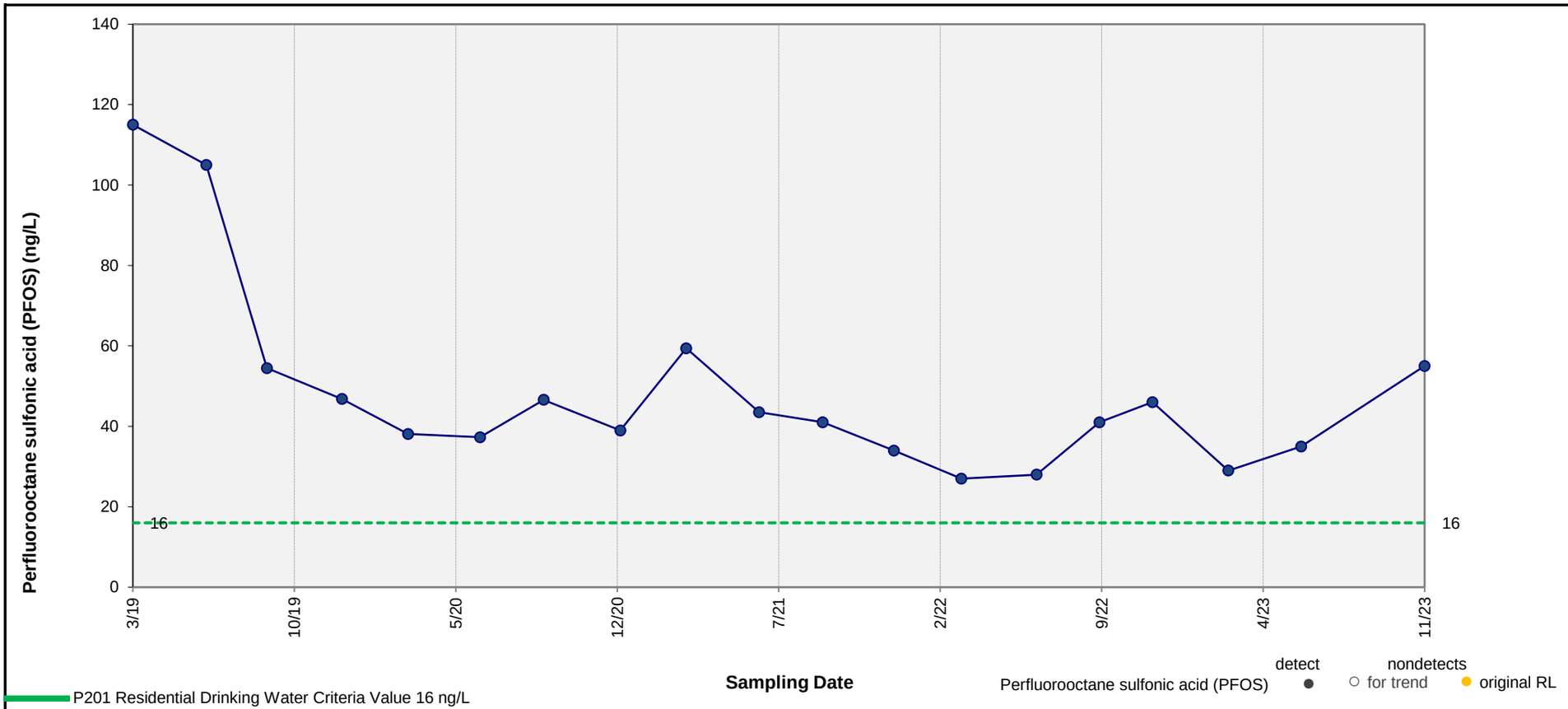
p value = 0.007 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-91

RACER Lansing

Figure F-49



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

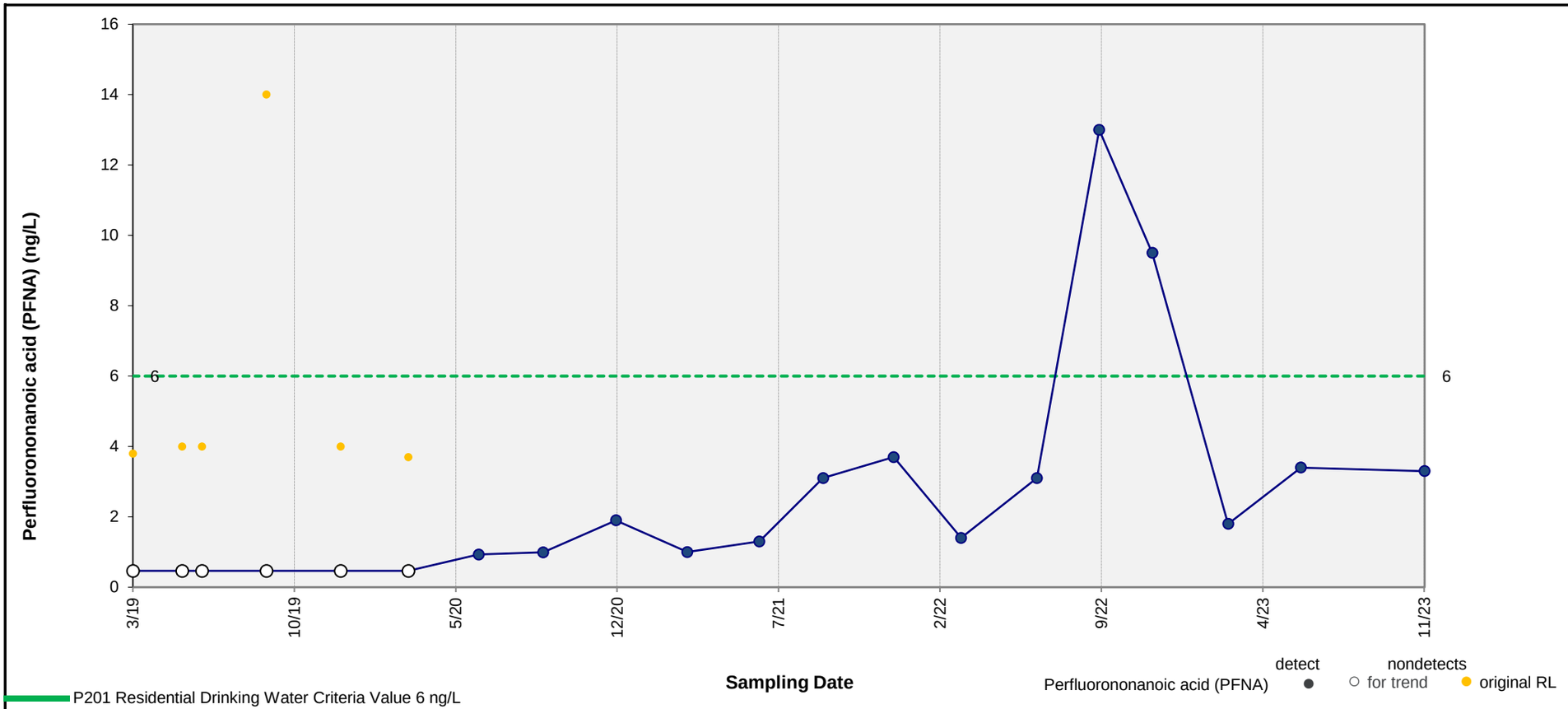
p value = 0.014 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-95

RACER Lansing

Figure F-50



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

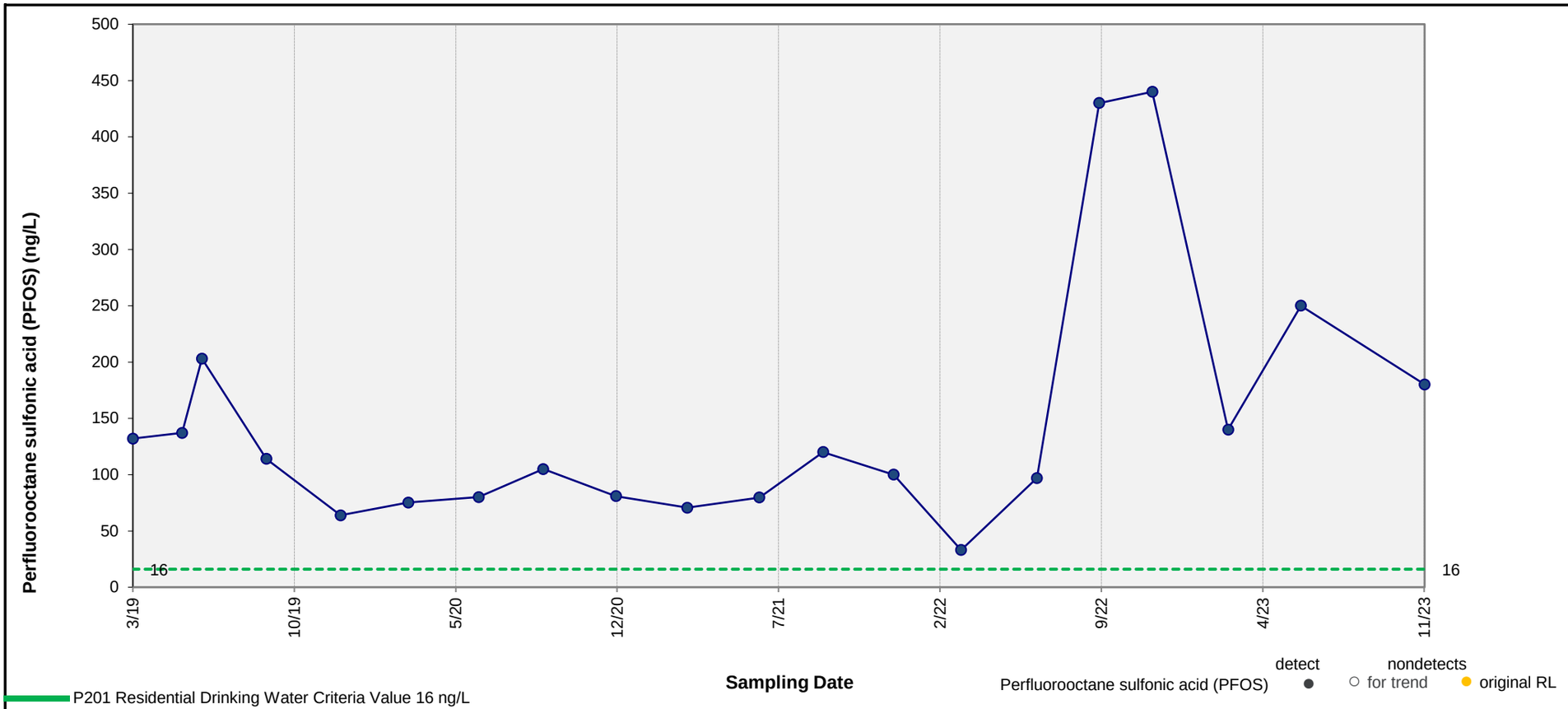
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-18-98

RACER Lansing

Figure F-51



Results of Mann-Kendall Test for Trend: **No Significant Trend**

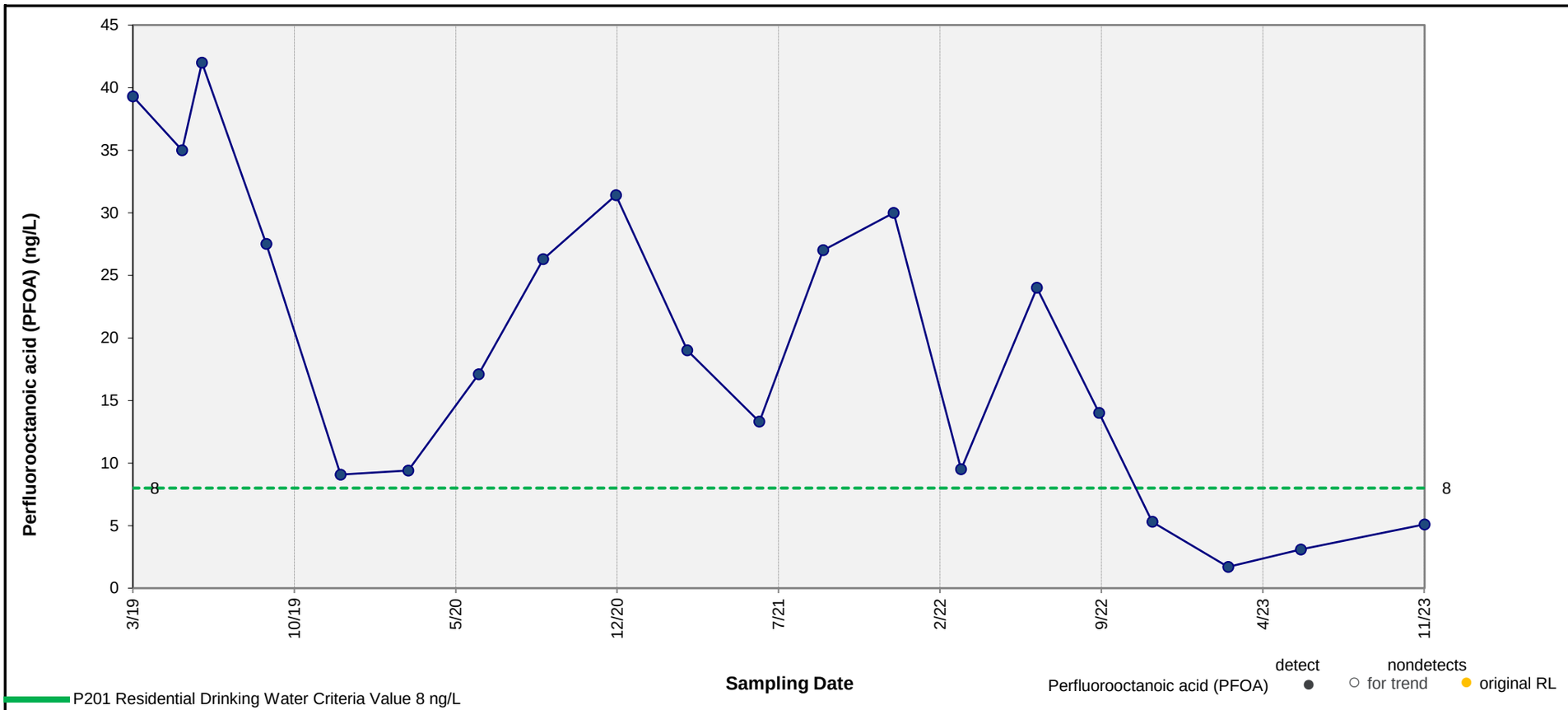
p value = 0.128 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-98

RACER Lansing

Figure F-52



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

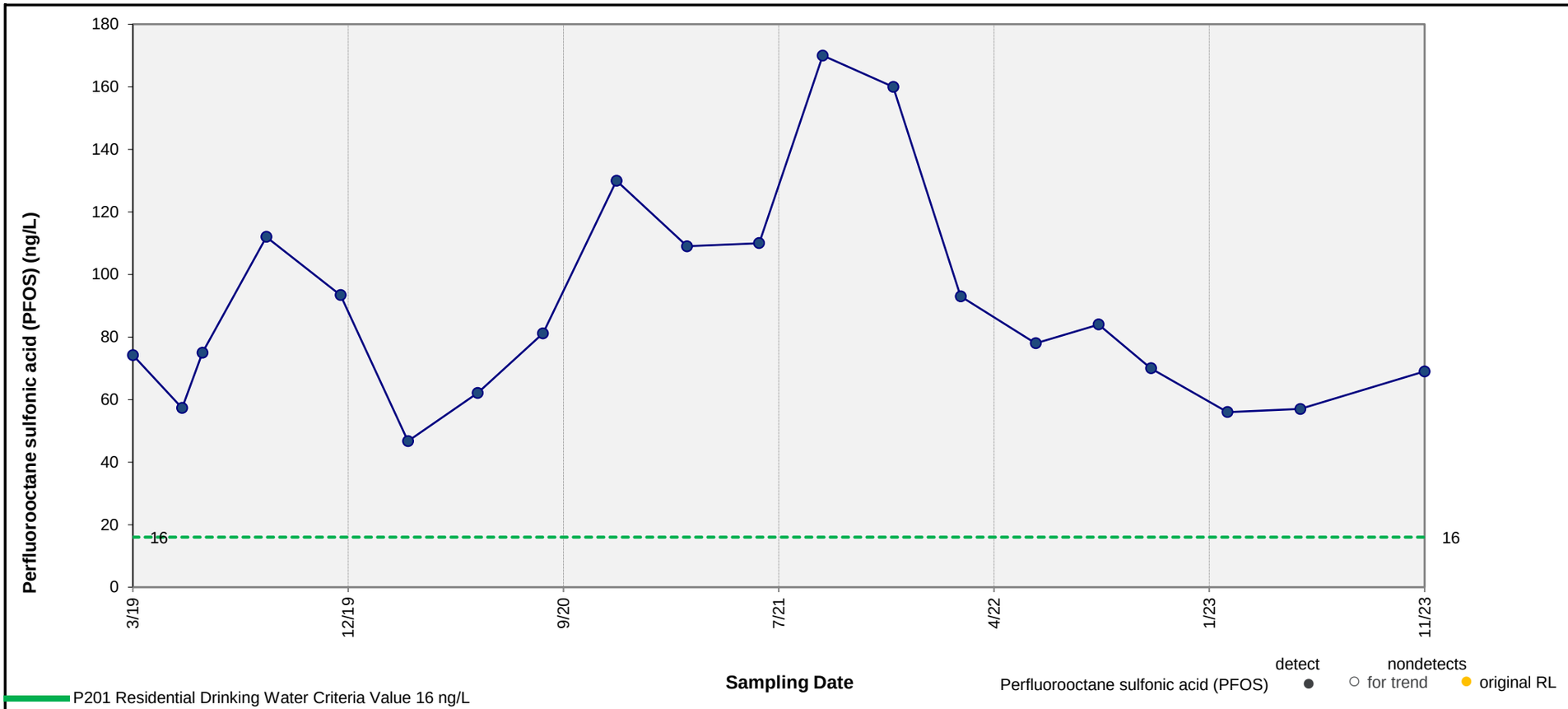
p value = 0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-18-98

RACER Lansing

Figure F-53



Results of Mann-Kendall Test for Trend: **No Significant Trend**

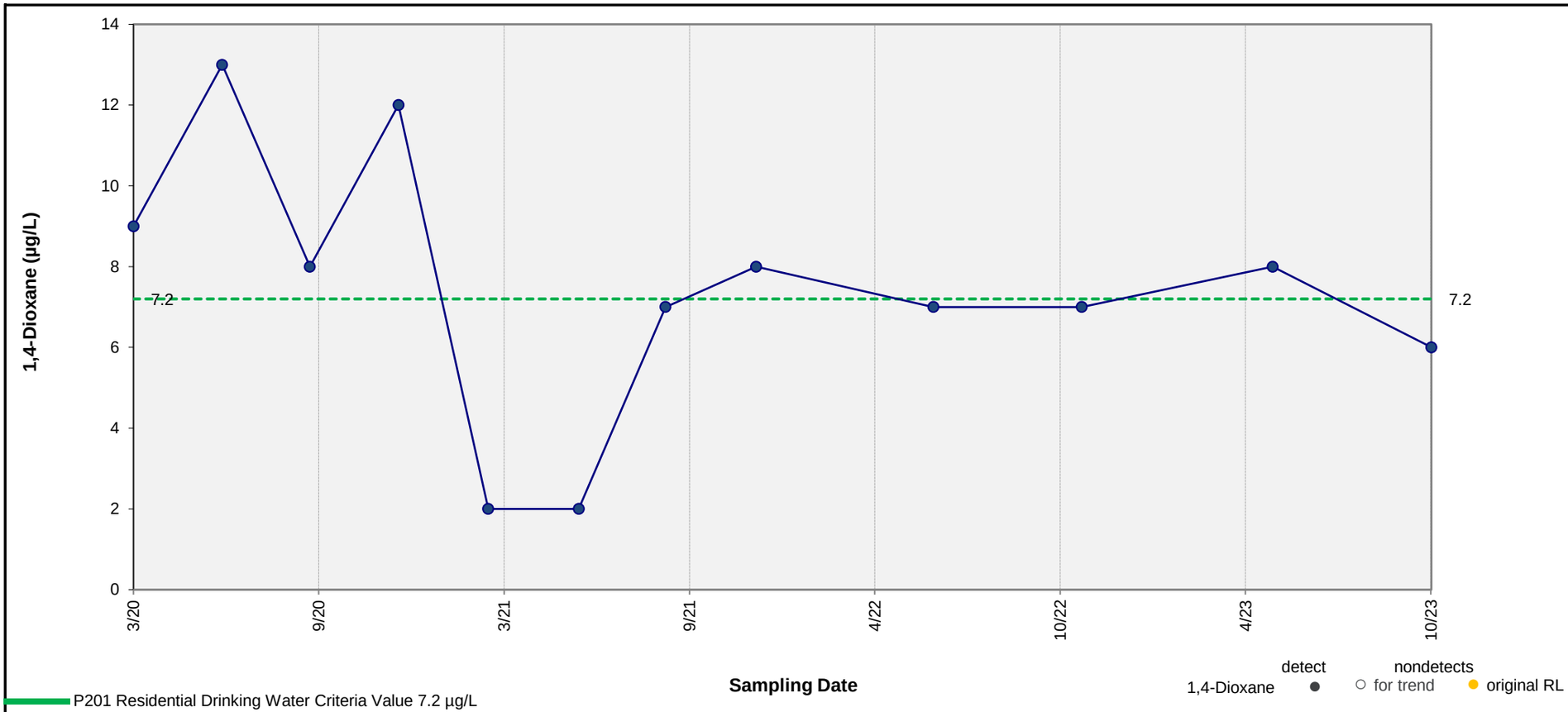
p value = 0.361 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-18-99

RACER Lansing

Figure F-54



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

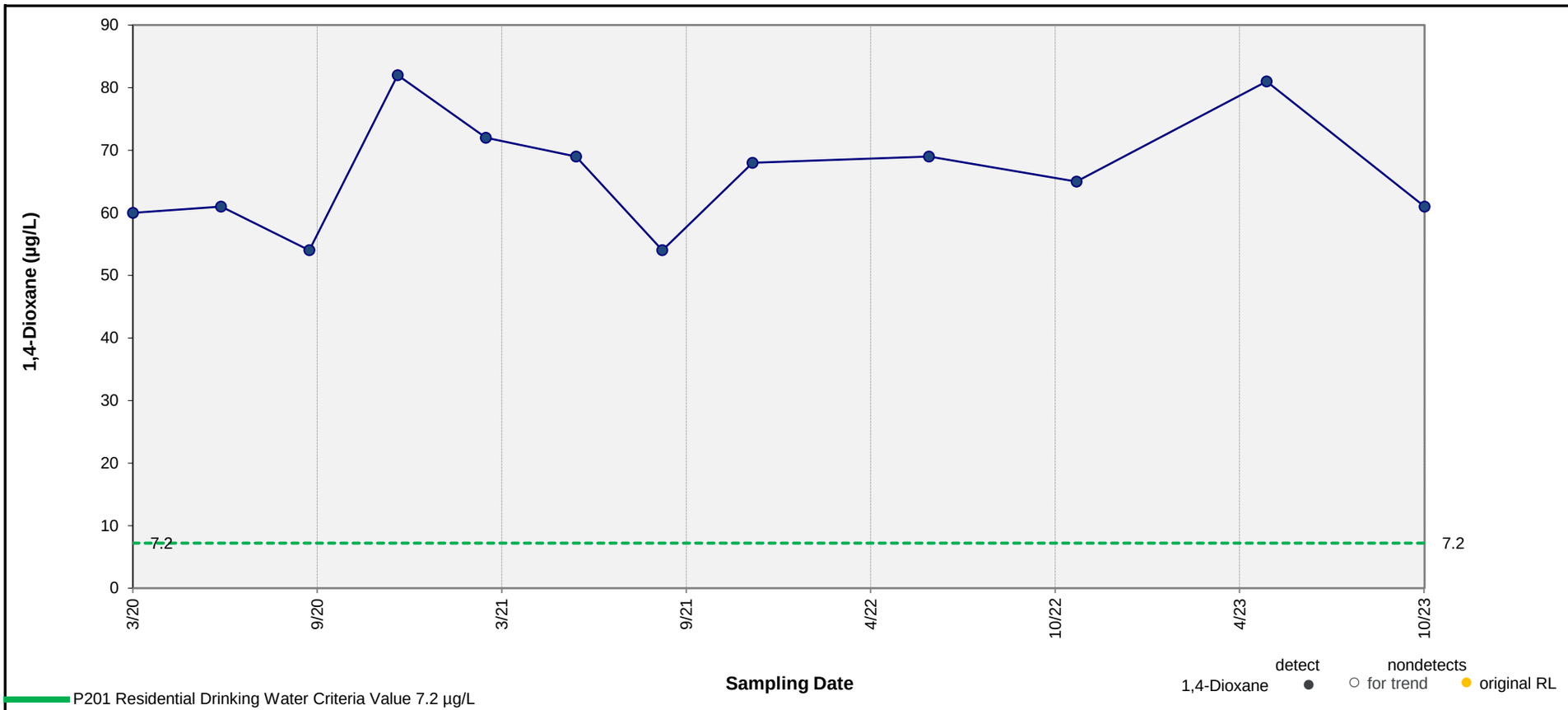
p value = 0.081 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-19-115

RACER Lansing

Figure F-55



Results of Mann-Kendall Test for Trend: **No Significant Trend**

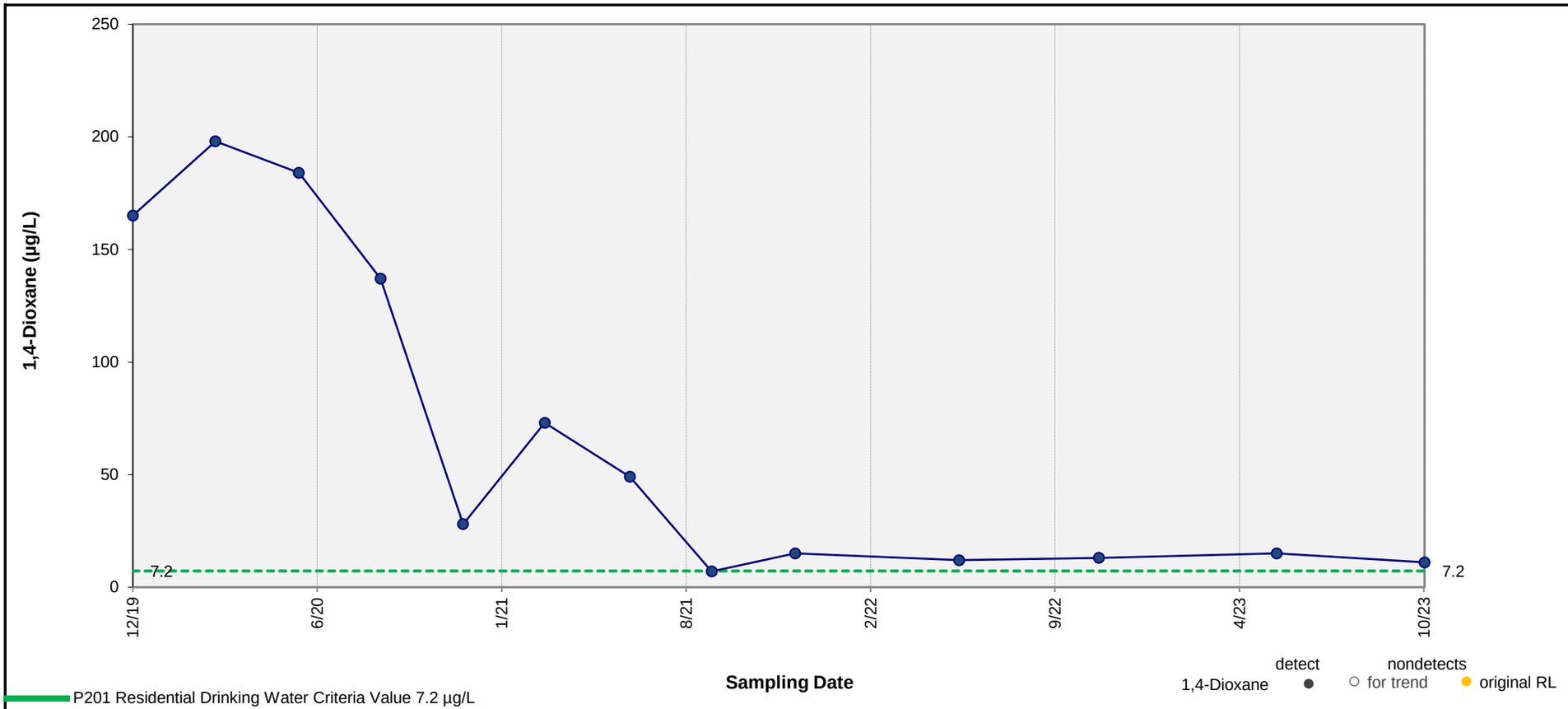
p value = 0.339 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-19-116

RACER Lansing

Figure F-56



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

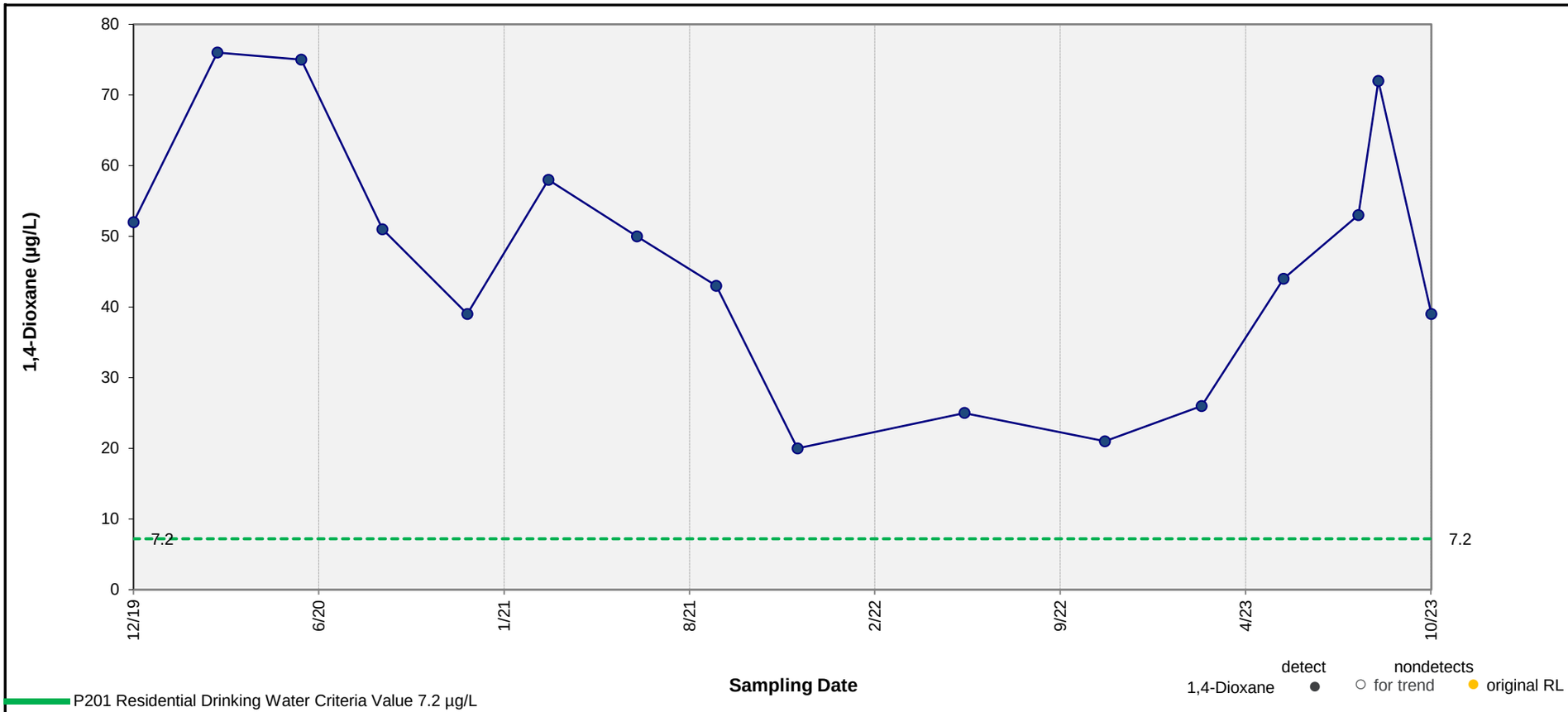
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-19-120

RACER Lansing

Figure F-57



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

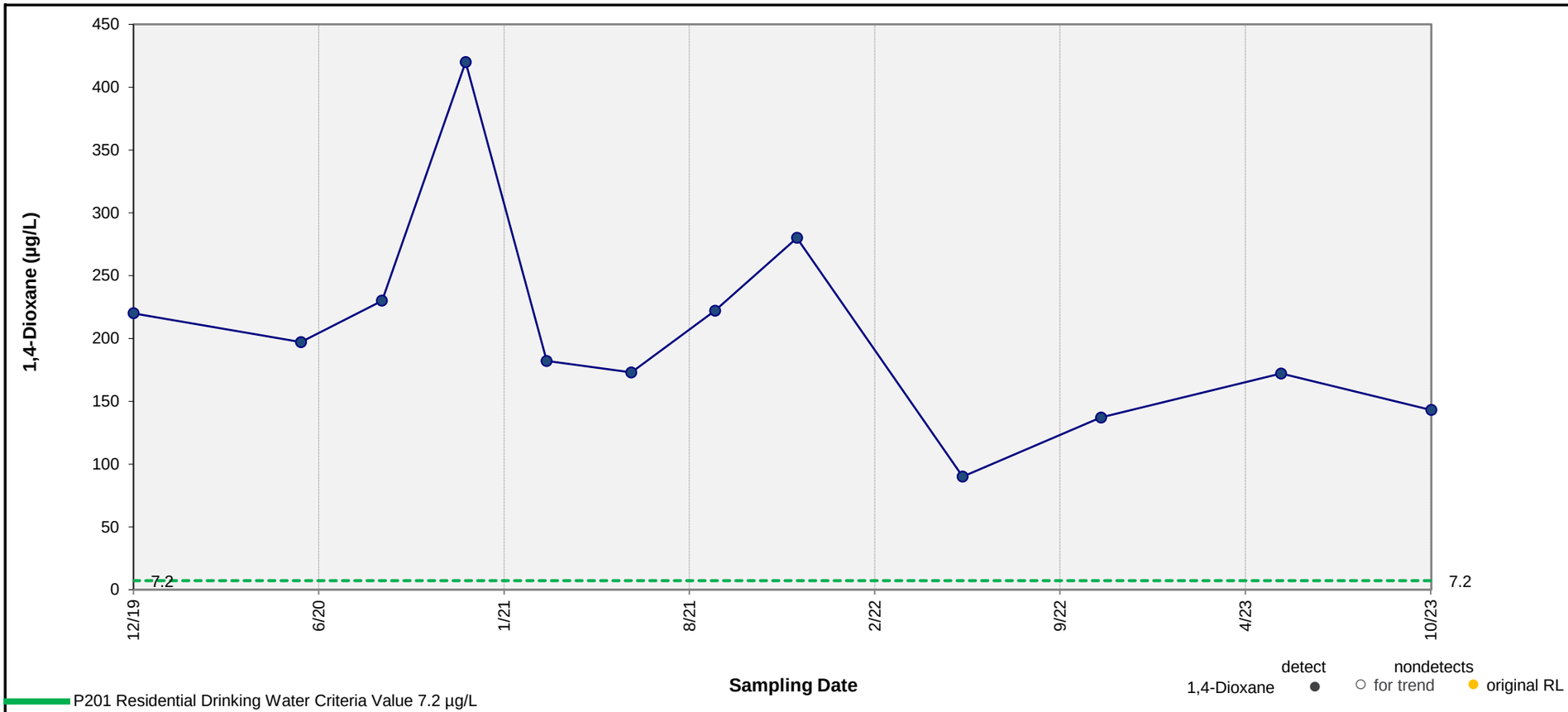
p value = 0.088 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-19-123

RACER Lansing

Figure F-58



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

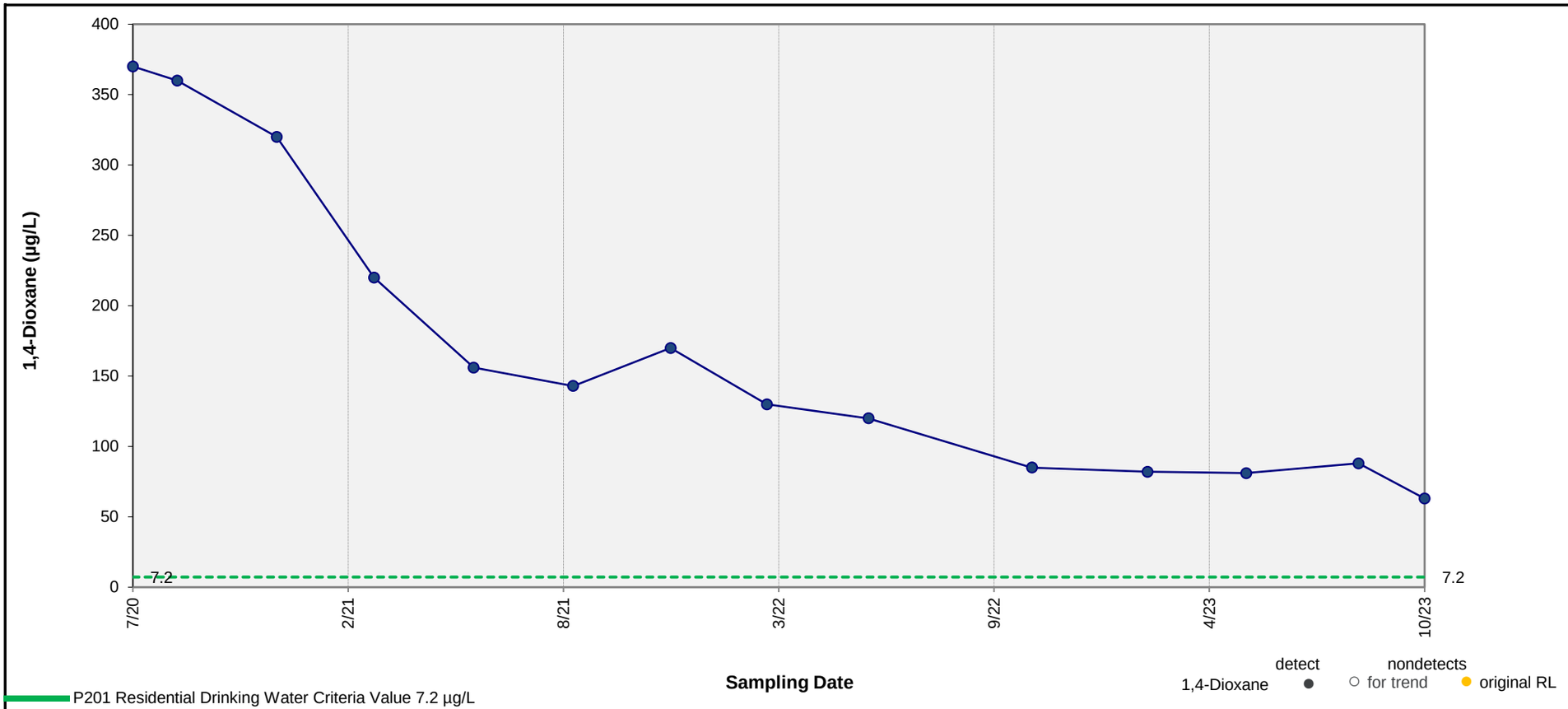
p value = 0.043 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-19-124

RACER Lansing

Figure F-59



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

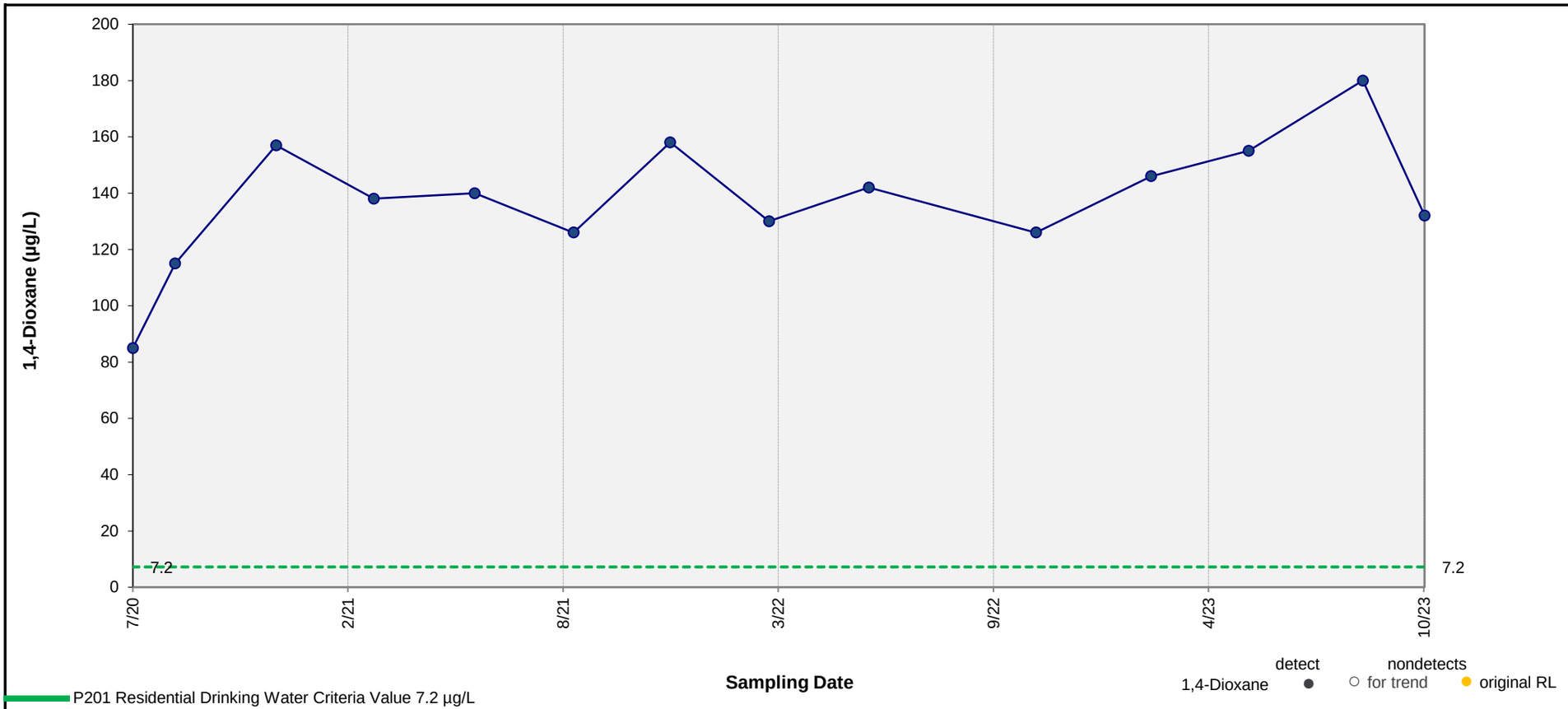
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-20-126

RACER Lansing

Figure F-60



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

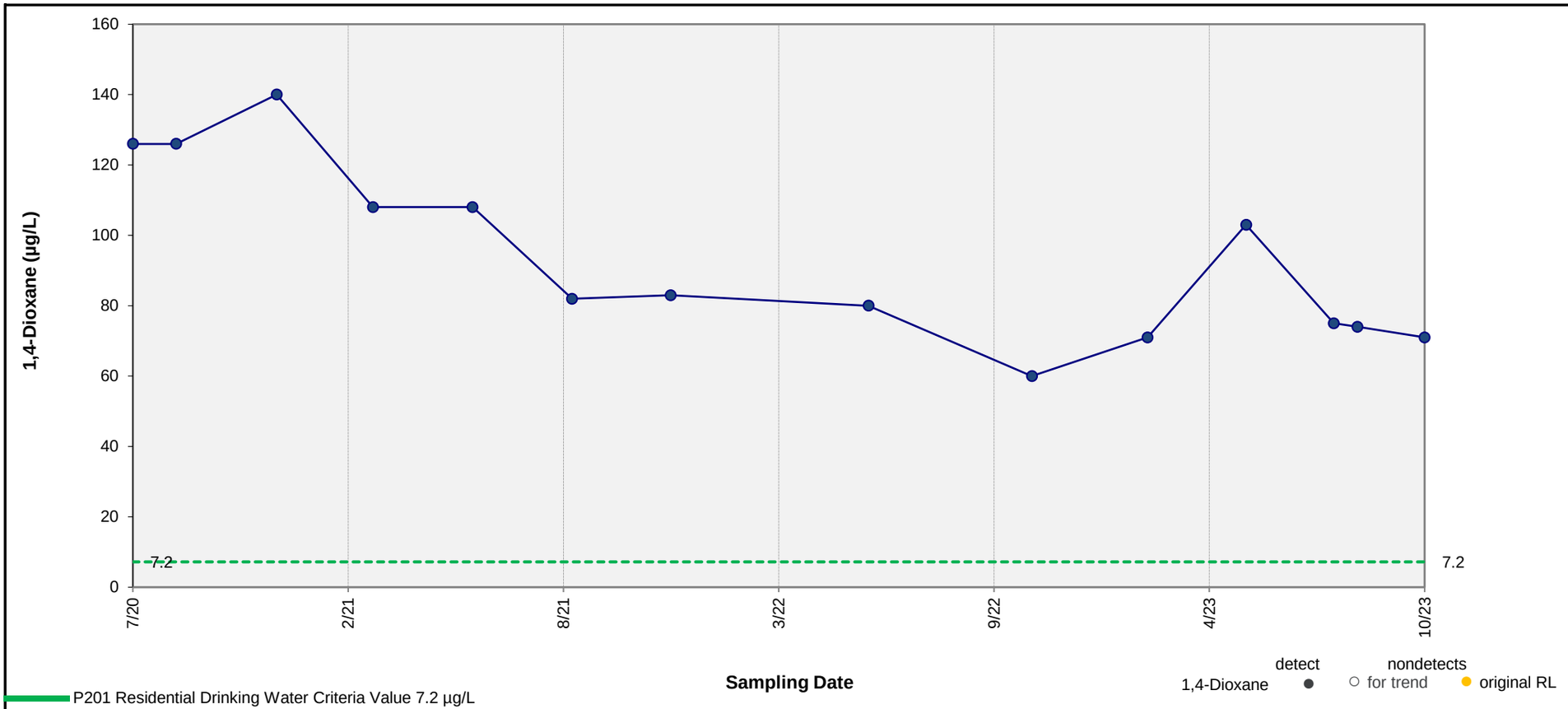
p value = 0.045 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-20-127

RACER Lansing

Figure F-61



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

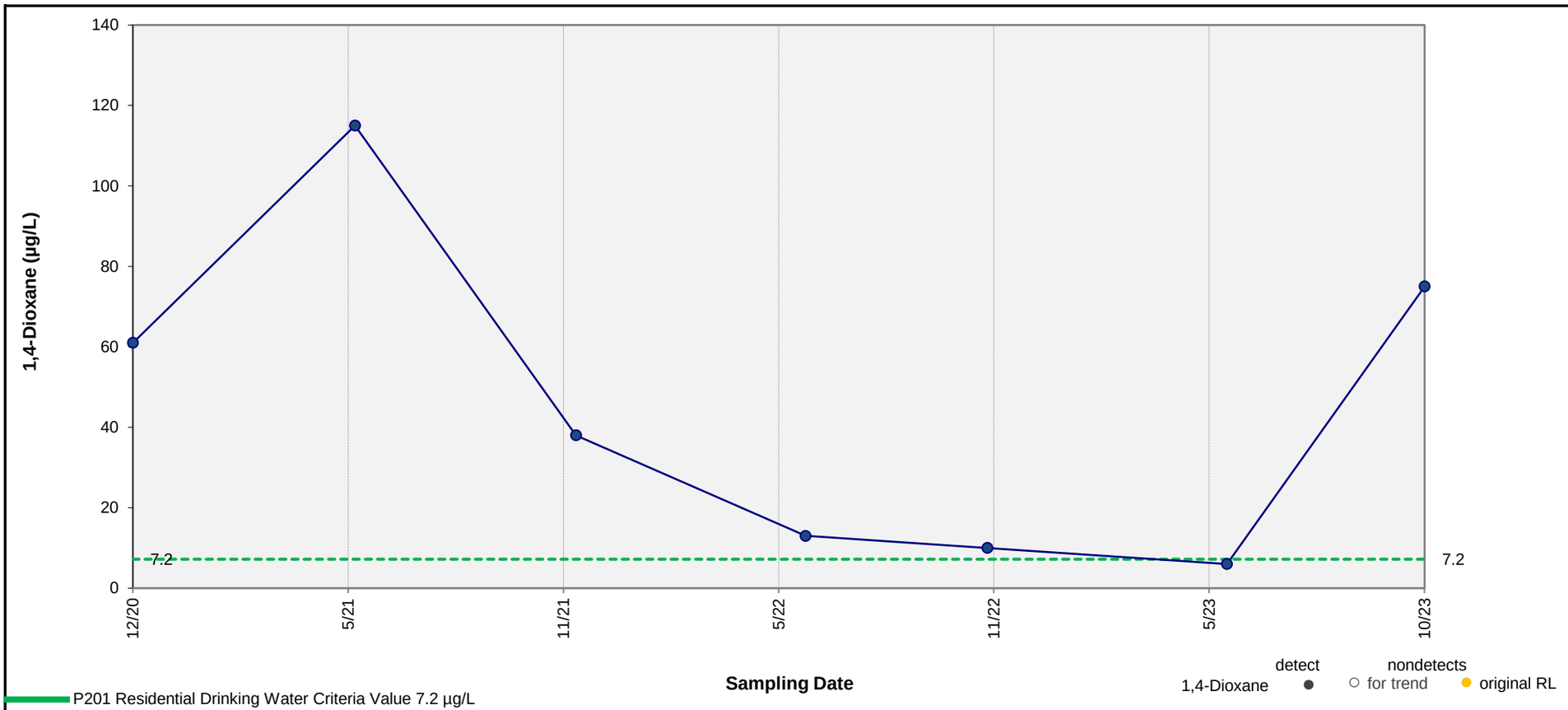
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-20-129

RACER Lansing

Figure F-62



Results of Mann-Kendall Test for Trend: **No Significant Trend**

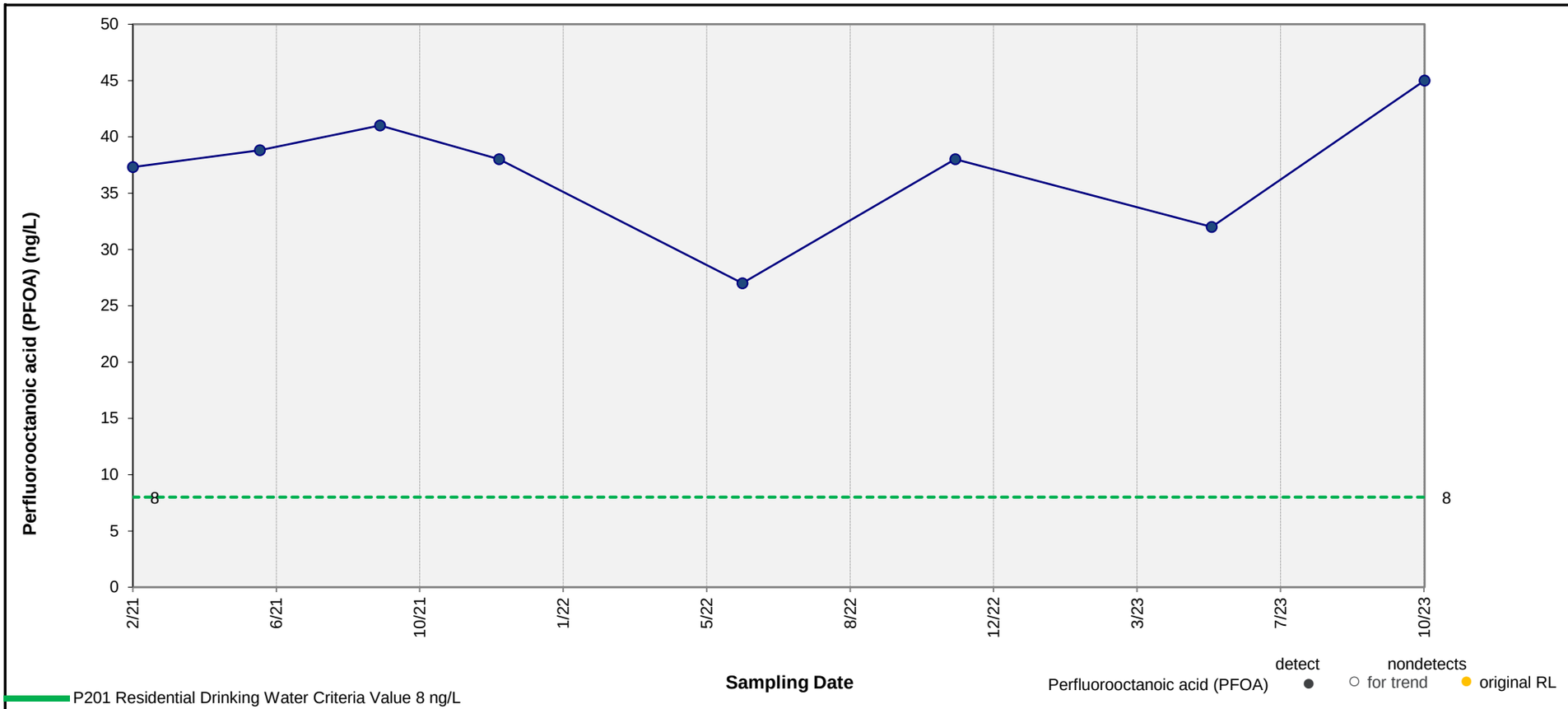
p value = 0.119 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-20-130

RACER Lansing

Figure F-63



Results of Mann-Kendall Test for Trend: **No Significant Trend**

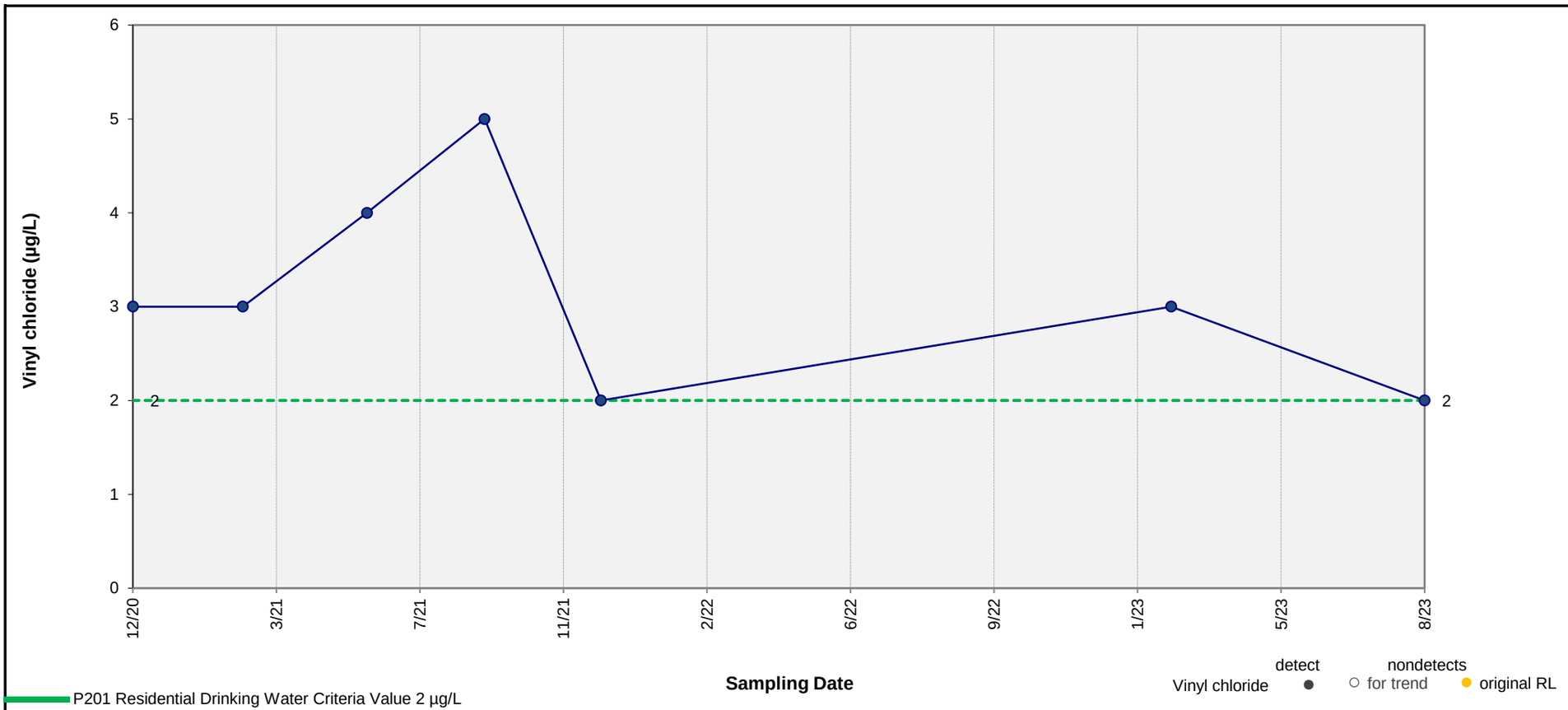
p value = 0.500 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-20-131

RACER Lansing

Figure F-64



Results of Mann-Kendall Test for Trend: **No Significant Trend**

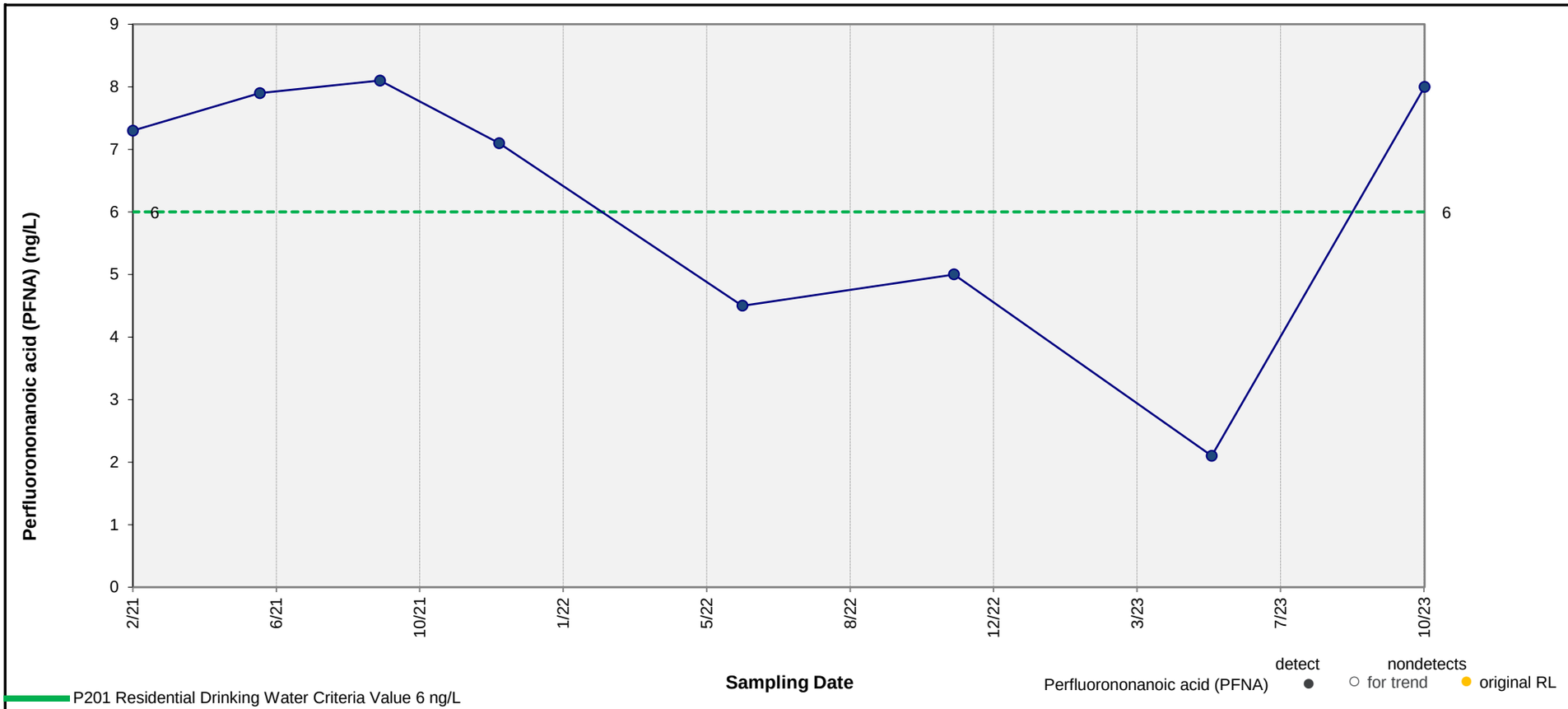
p value = 0.281 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Vinyl chloride in Well MW-20-131

RACER Lansing

Figure F-65



Results of Mann-Kendall Test for Trend: **No Significant Trend**

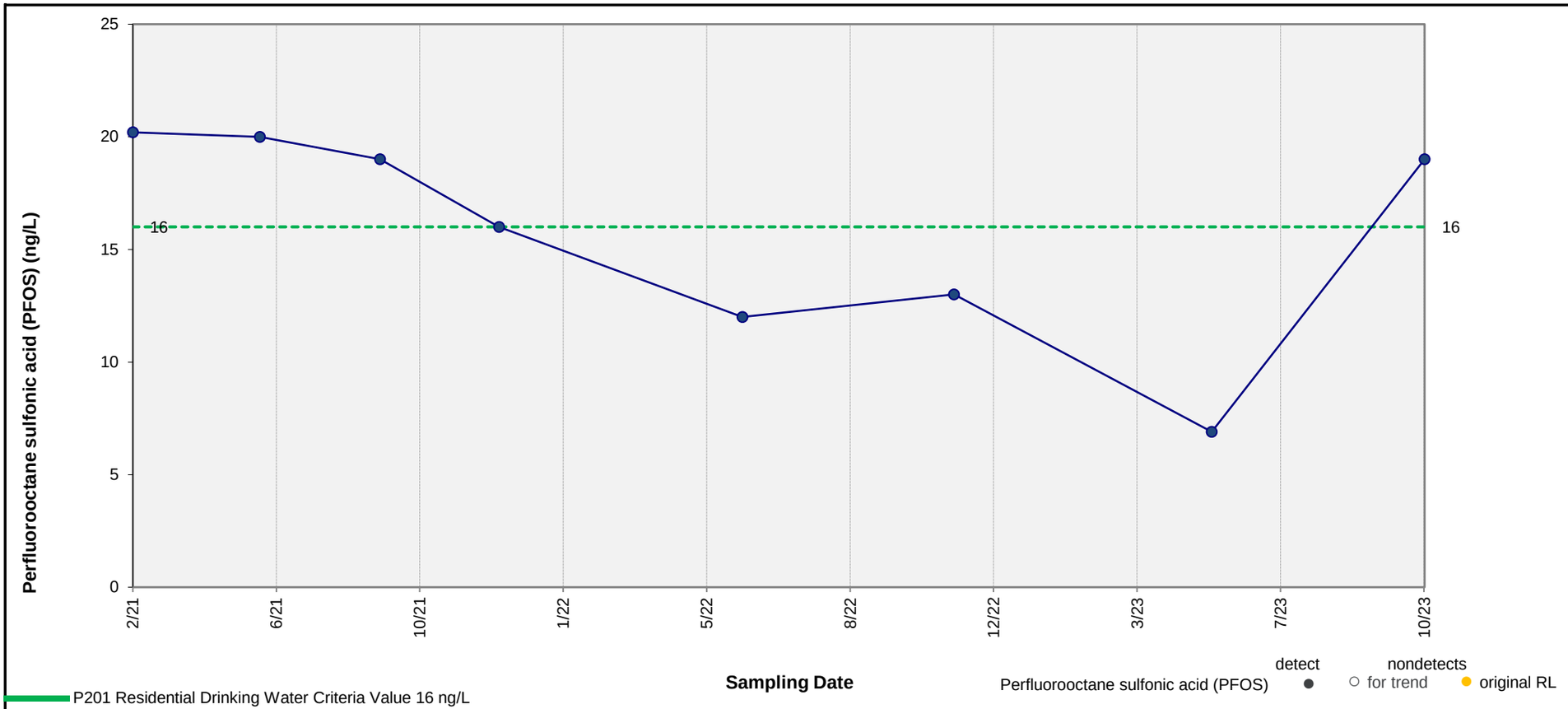
p value = 0.199 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-20-132

RACER Lansing

Figure F-66



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

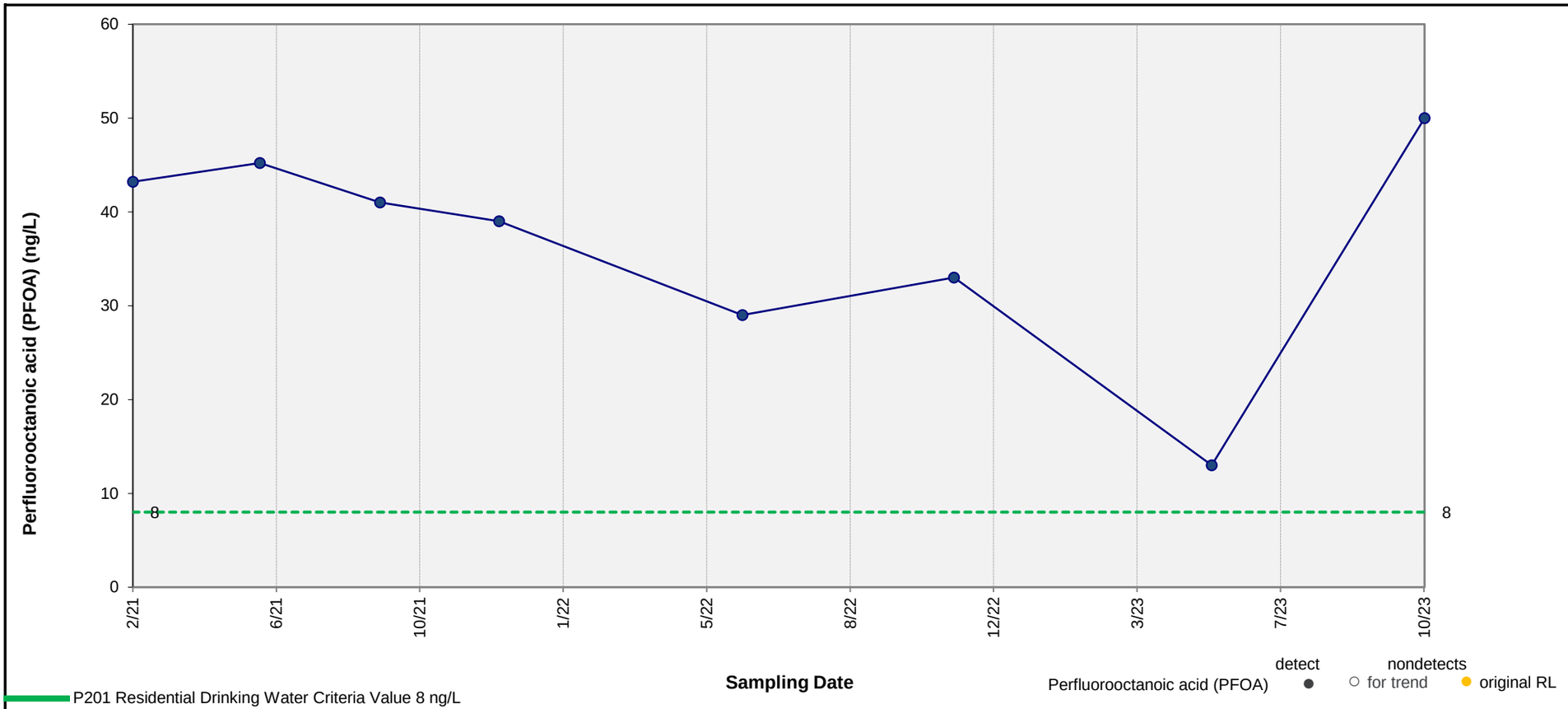
p value = 0.024 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-20-132

RACER Lansing

Figure F-67



Results of Mann-Kendall Test for Trend: **No Significant Trend**

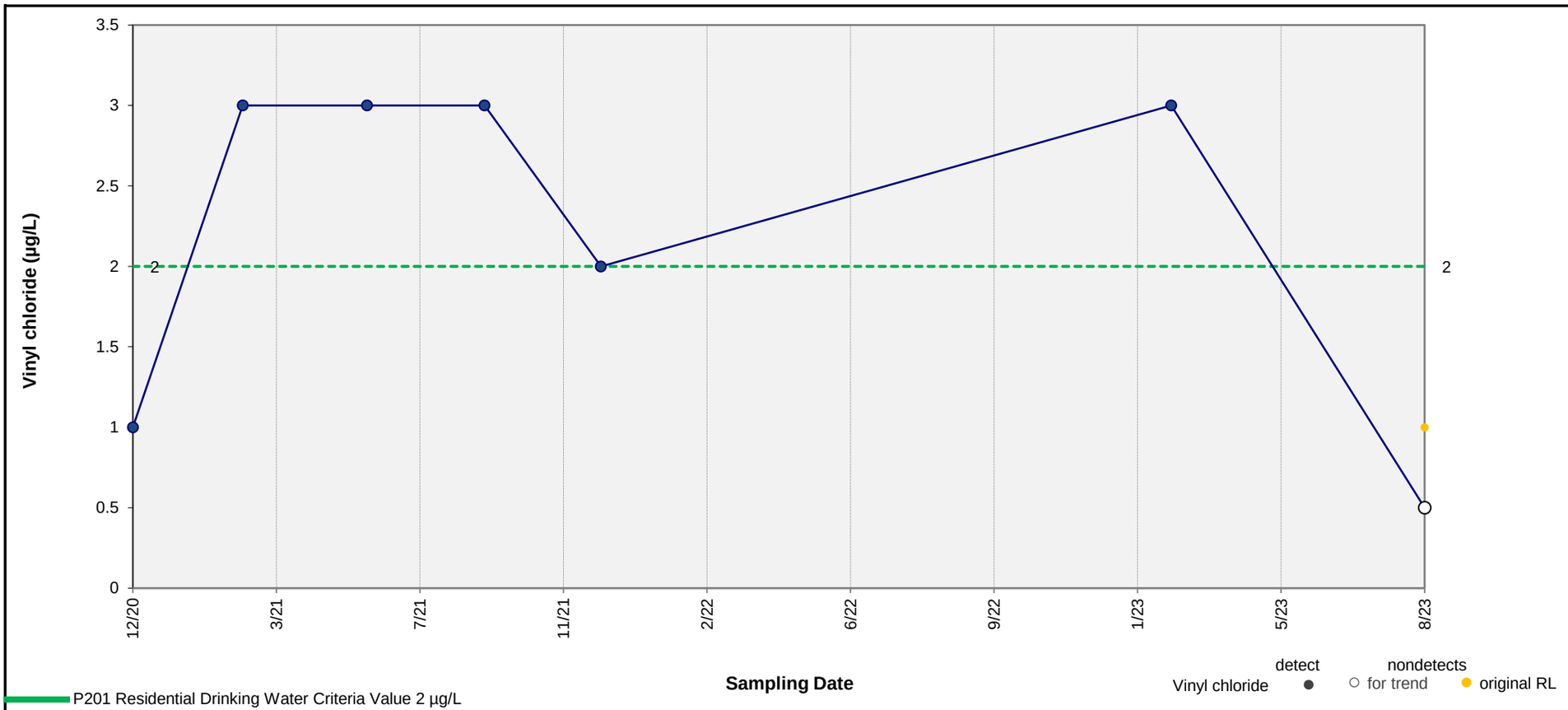
p value = 0.138 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-20-132

RACER Lansing

Figure F-68



Results of Mann-Kendall Test for Trend: **No Significant Trend**

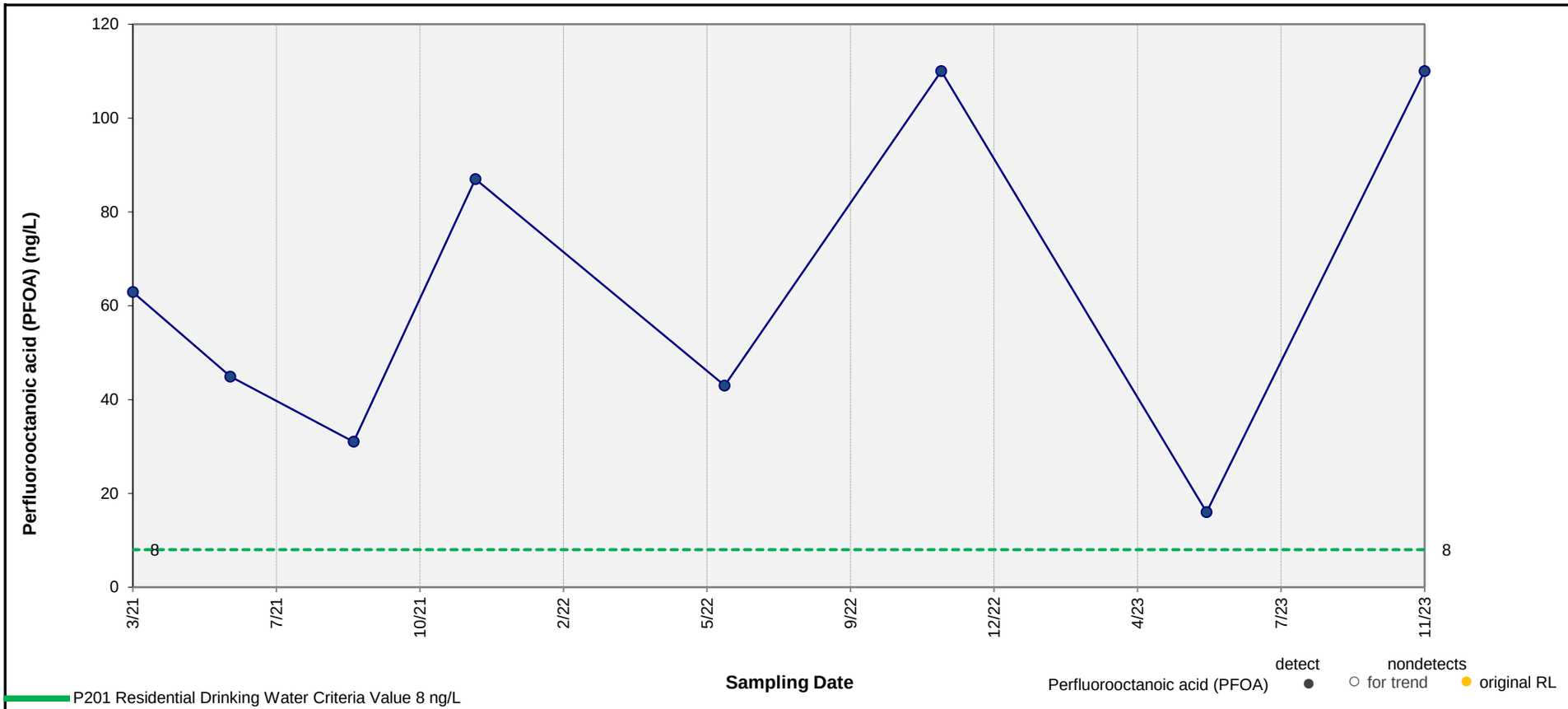
p value = 0.386 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Vinyl chloride in Well MW-20-132

RACER Lansing

Figure F-69



Results of Mann-Kendall Test for Trend: **No Significant Trend**

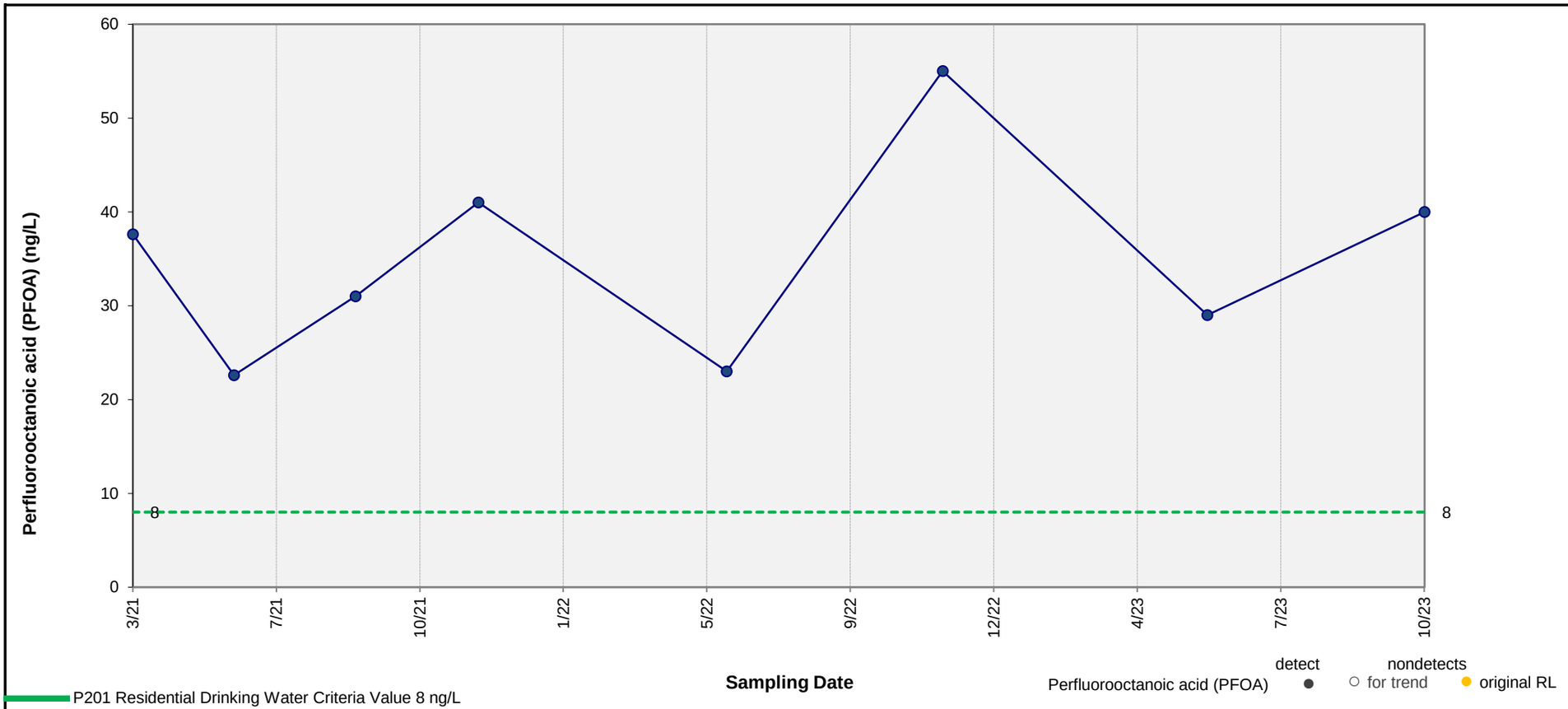
p value = 0.406 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-21-133

RACER Lansing

Figure F-70



Results of Mann-Kendall Test for Trend: **No Significant Trend**

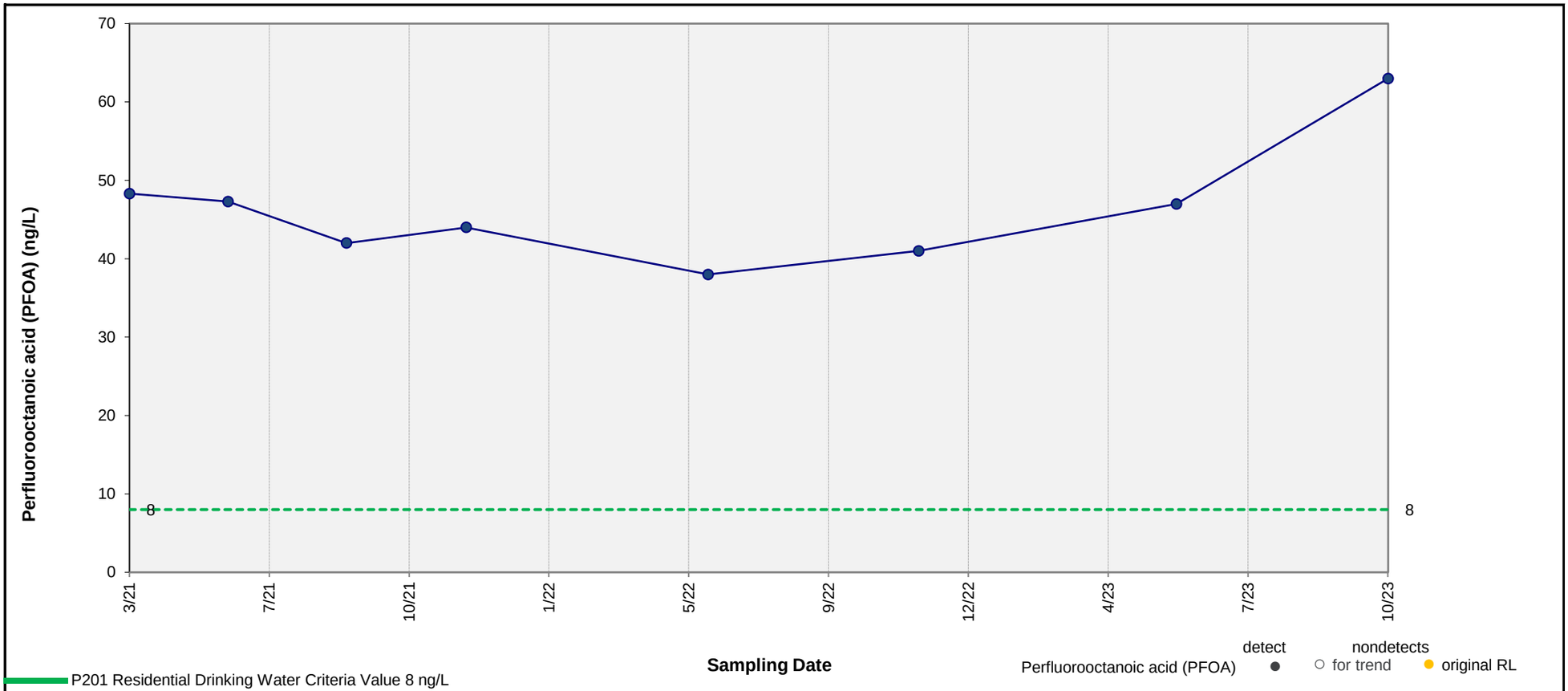
p value = 0.274 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-21-134

RACER Lansing

Figure F-71



Results of Mann-Kendall Test for Trend: **No Significant Trend**

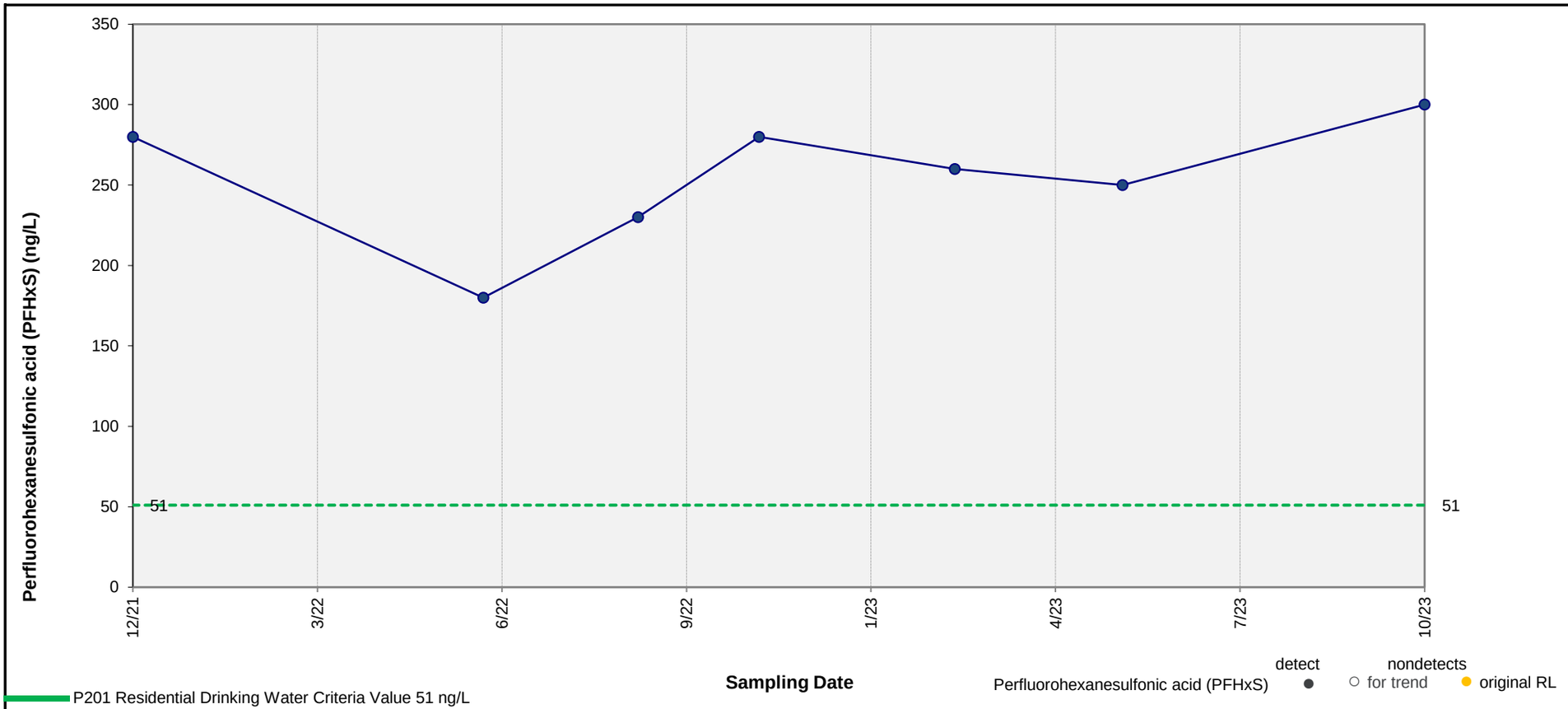
p value = 0.452 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-21-135

RACER Lansing

Figure F-72



Results of Mann-Kendall Test for Trend: **No Significant Trend**

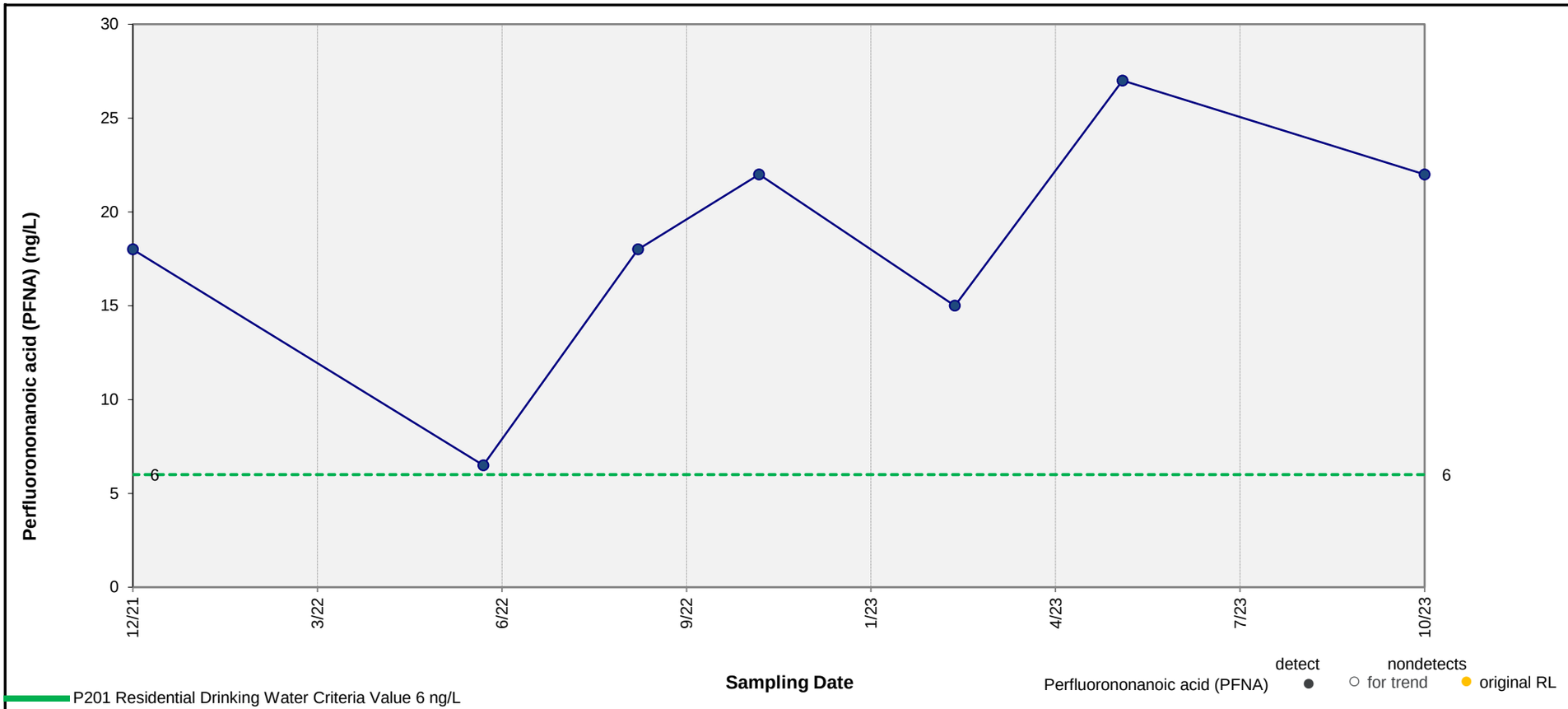
p value = 0.236 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorohexanesulfonic acid (PFHxS) in Well MW-21-139

RACER Lansing

Figure F-73



Results of Mann-Kendall Test for Trend: **No Significant Trend**

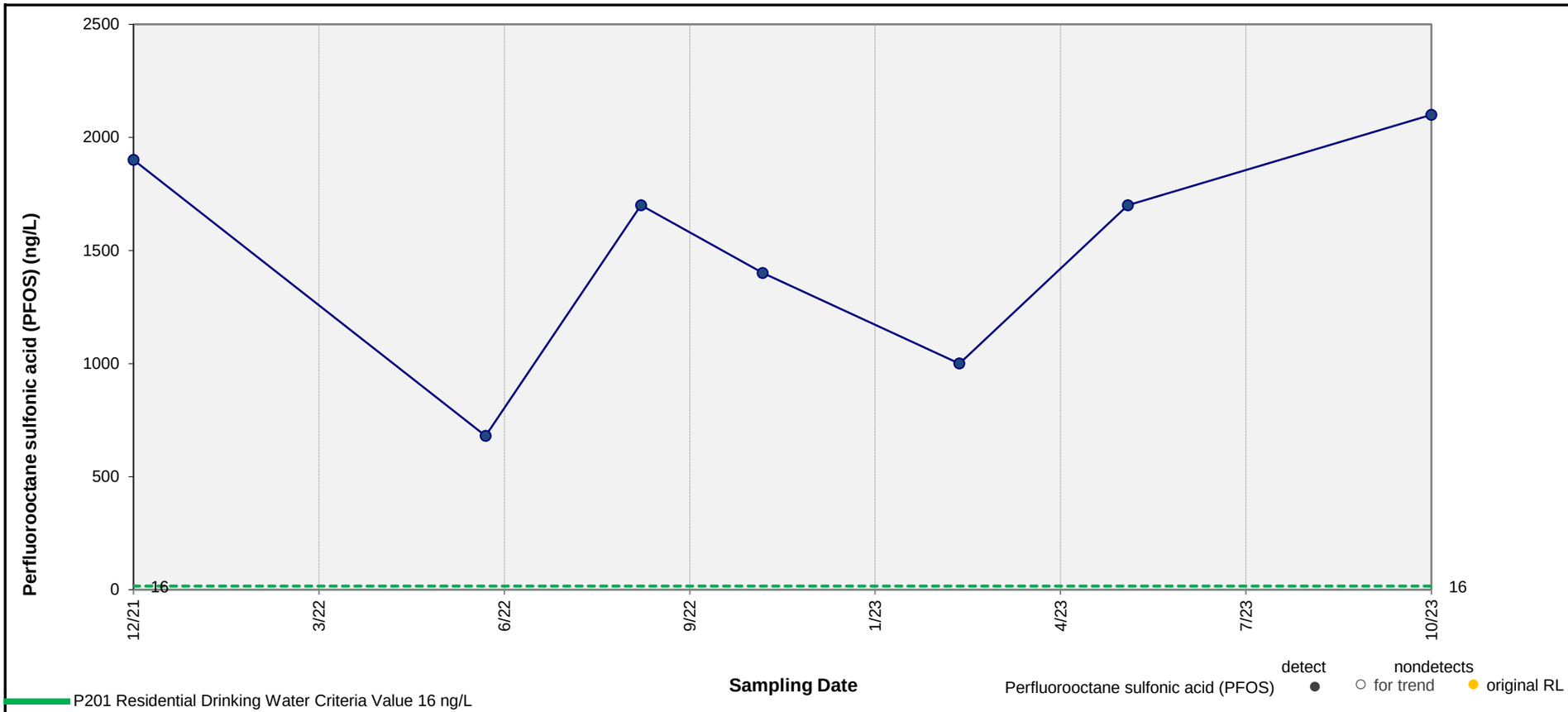
p value = 0.119 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well MW-21-139

RACER Lansing

Figure F-74



Results of Mann-Kendall Test for Trend: **No Significant Trend**

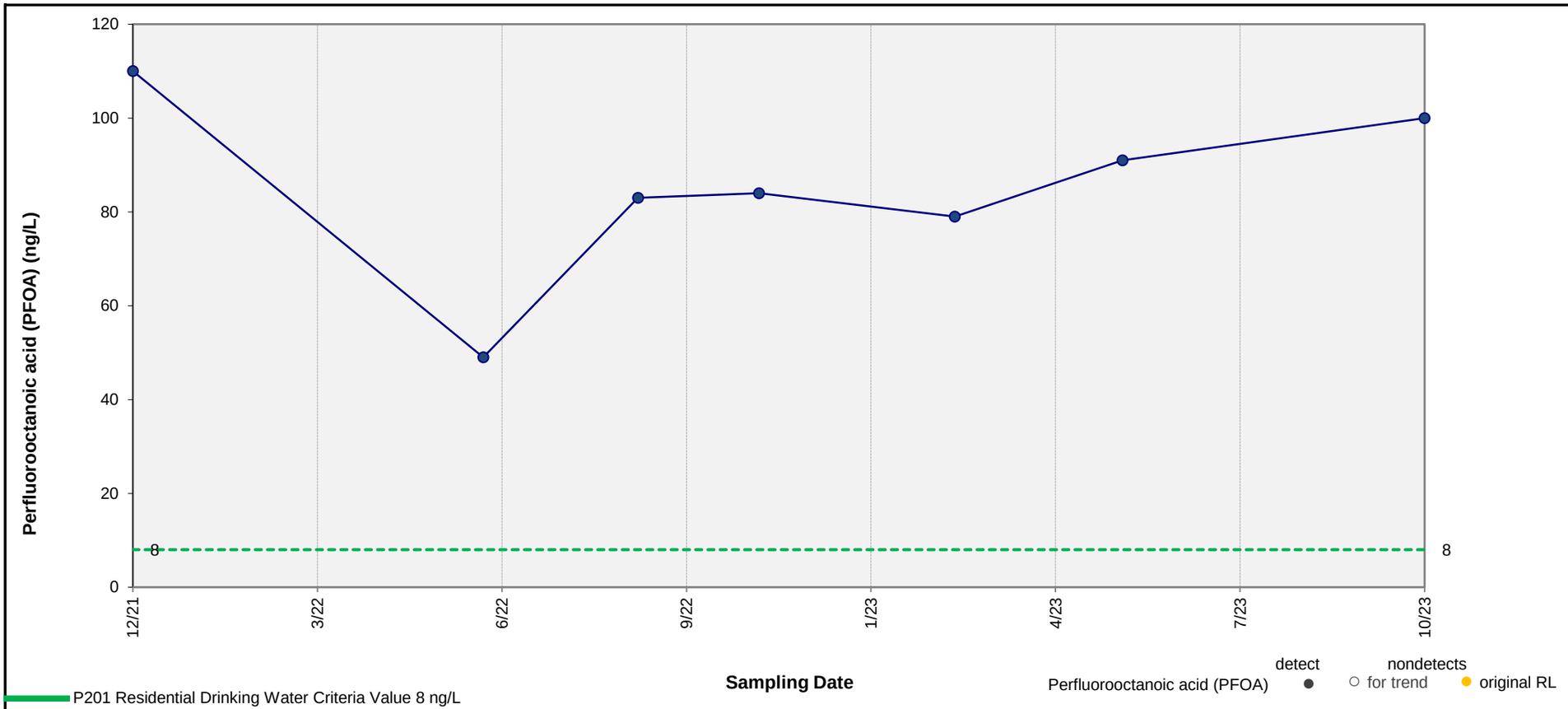
p value = 0.334 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well MW-21-139

RACER Lansing

Figure F-75



Results of Mann-Kendall Test for Trend: **No Significant Trend**

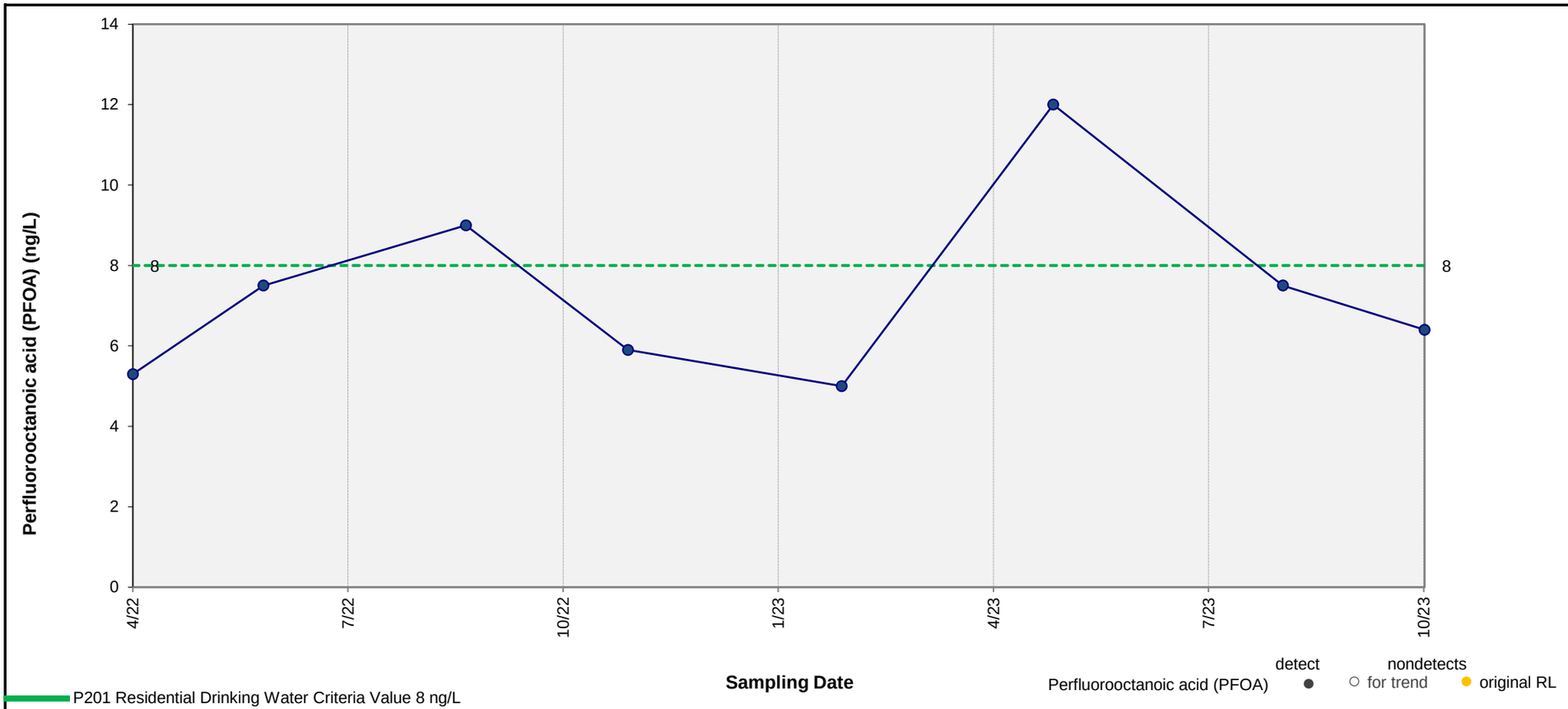
p value = 0.281 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-21-139

RACER Lansing

Figure F-76



Results of Mann-Kendall Test for Trend: **No Significant Trend**

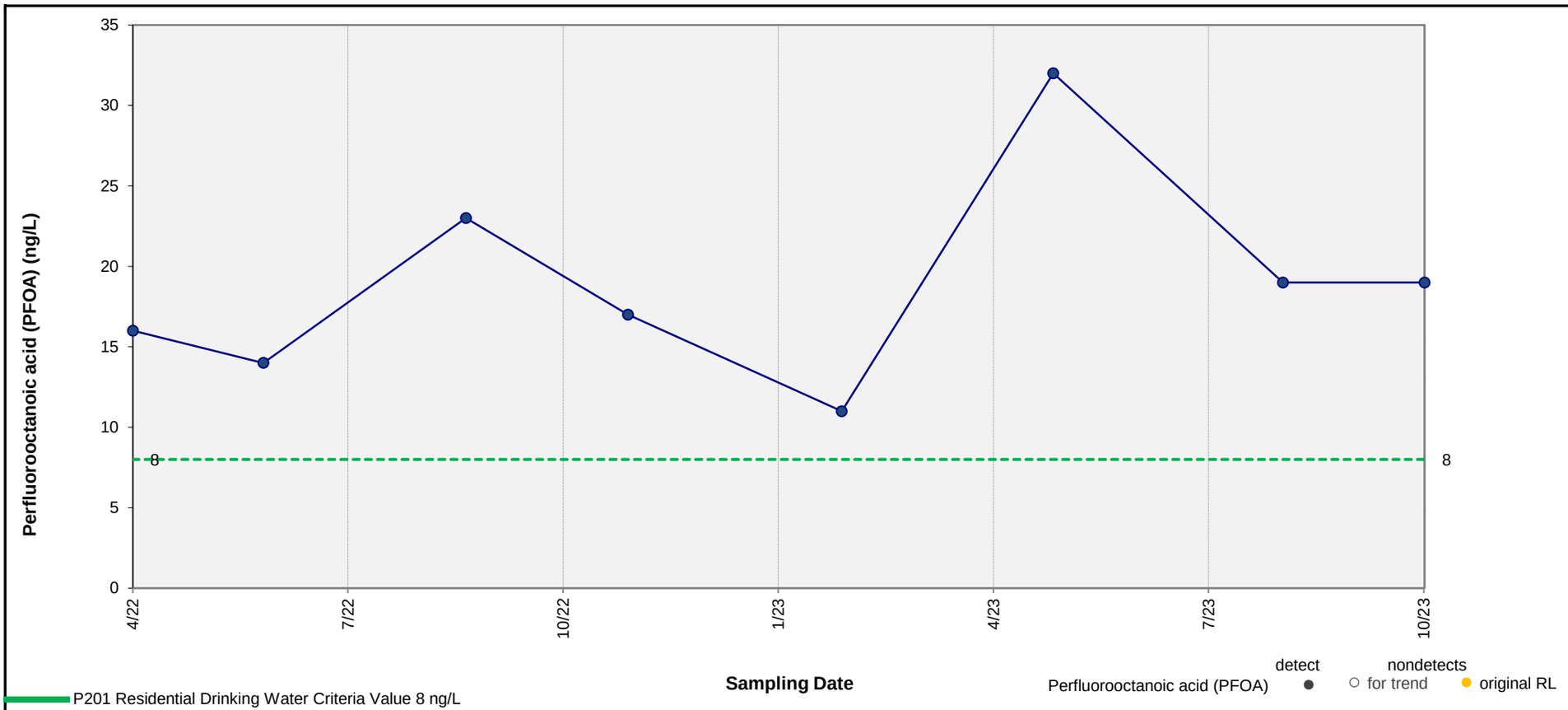
p value = 0.406 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-22-144

RACER Lansing

Figure F-77



Results of Mann-Kendall Test for Trend: **No Significant Trend**

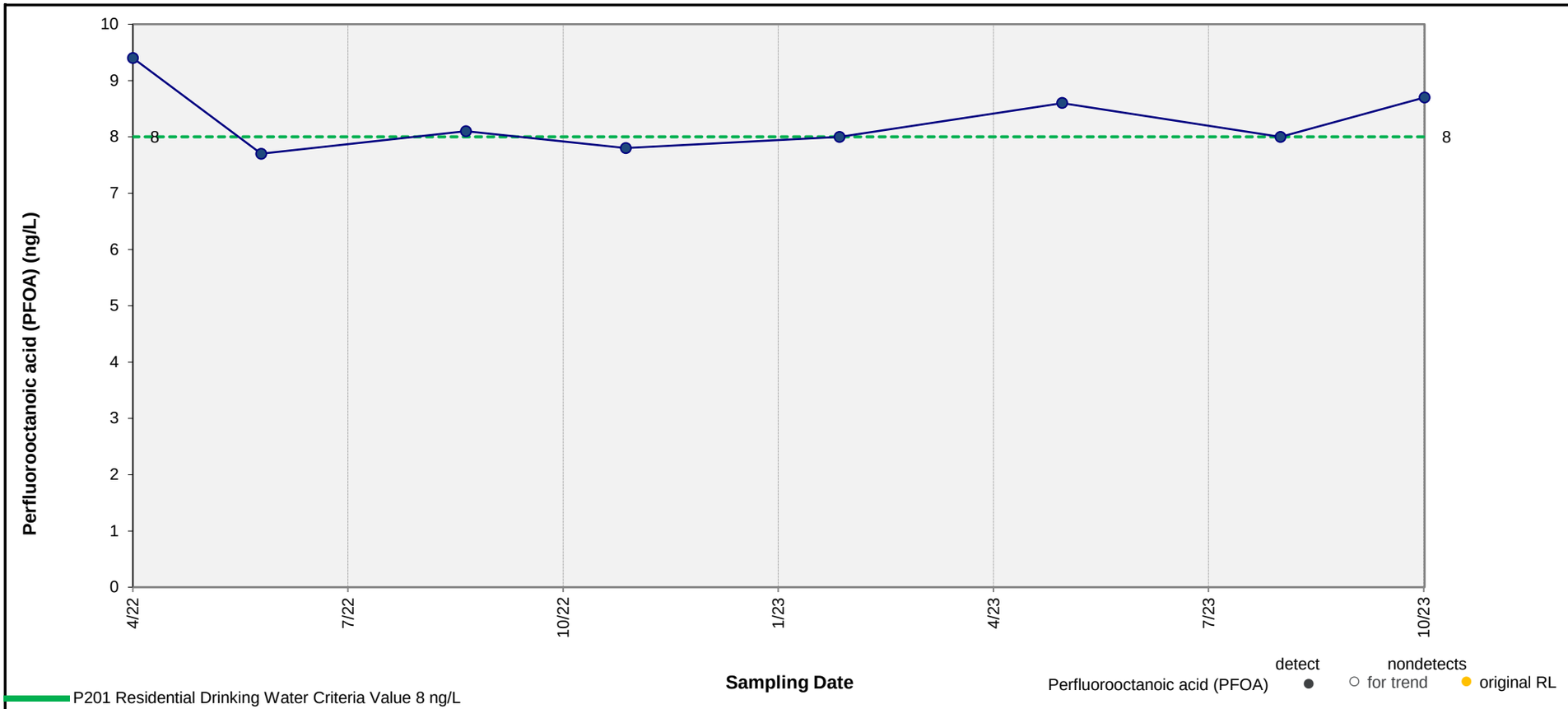
p value = 0.237 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-22-145

RACER Lansing

Figure F-78



Results of Mann-Kendall Test for Trend: **No Significant Trend**

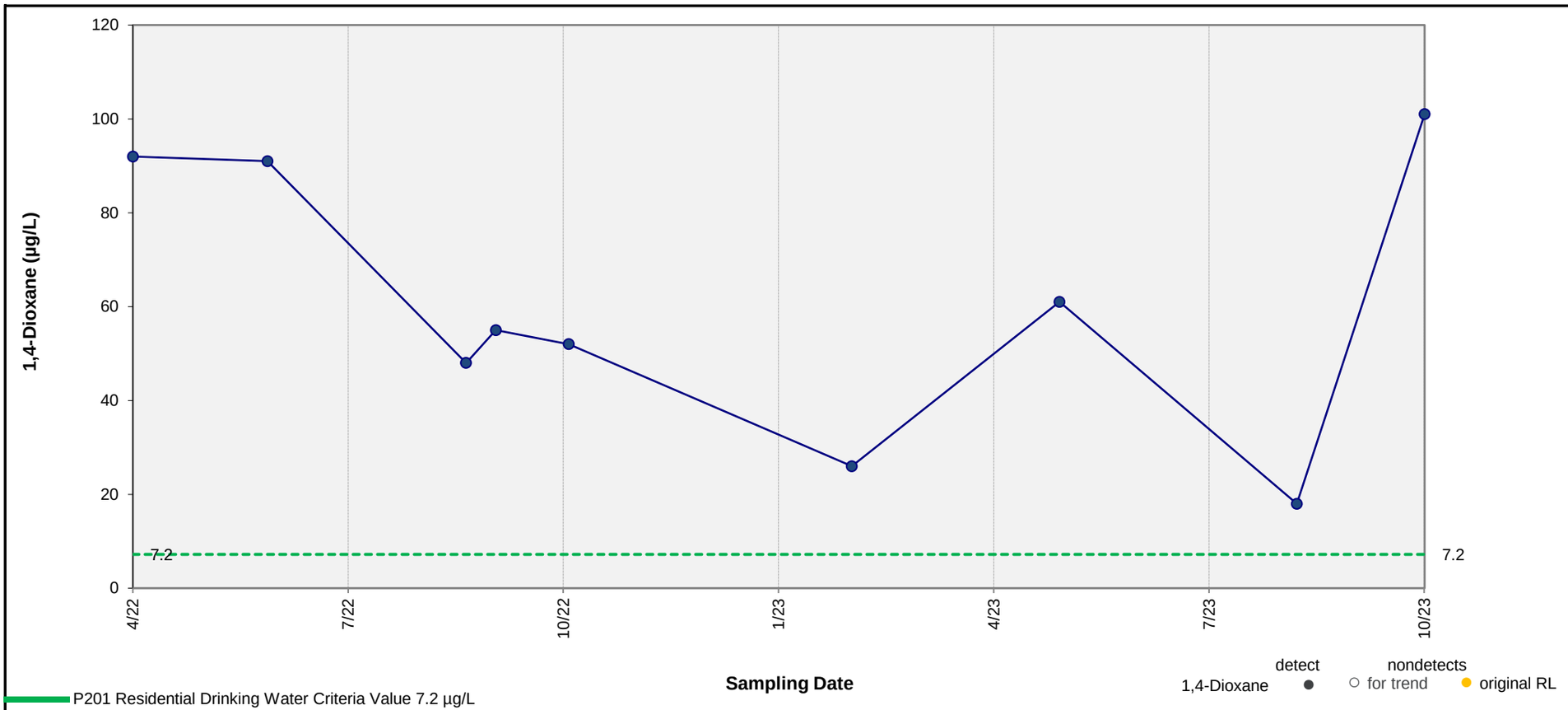
p value = 0.317 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well MW-22-151

RACER Lansing

Figure F-79



Results of Mann-Kendall Test for Trend: **No Significant Trend**

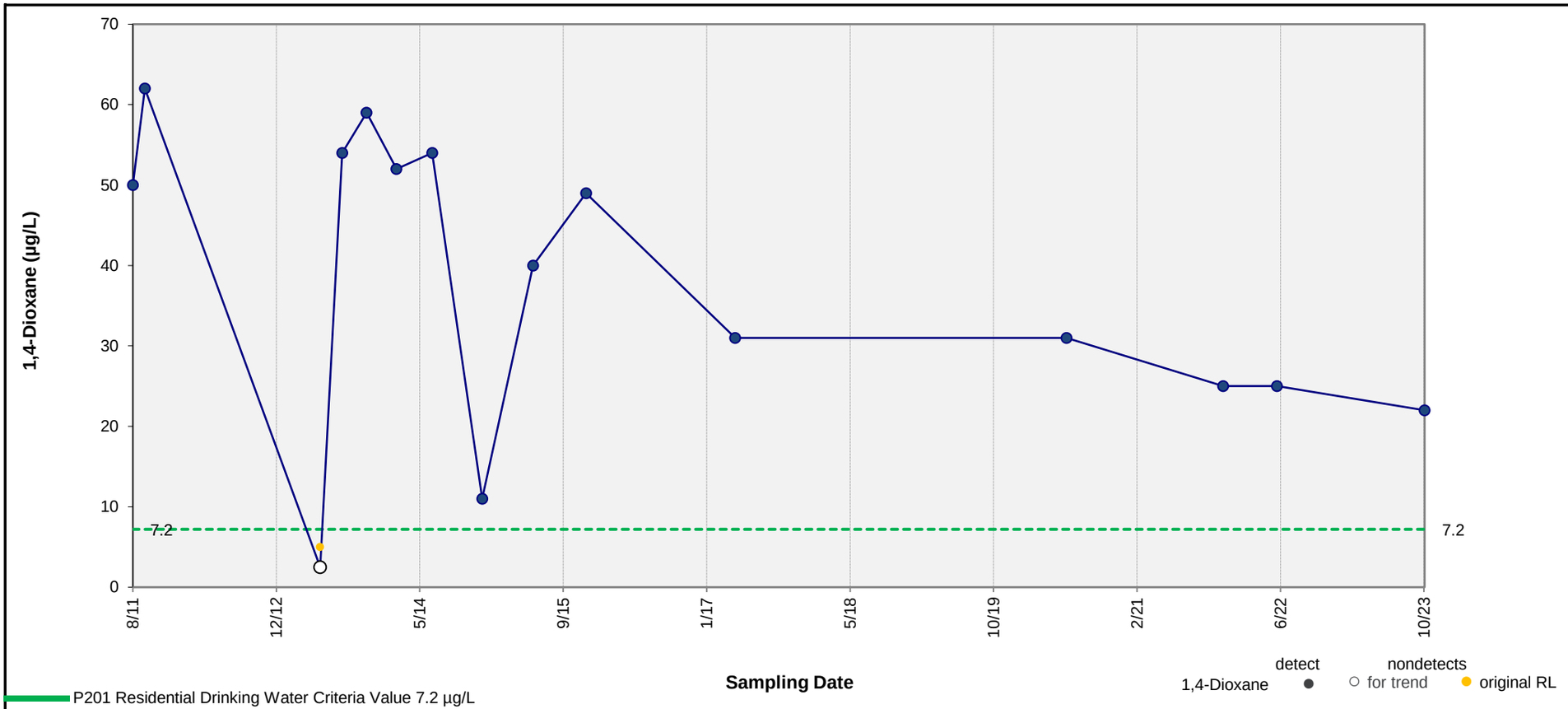
p value = 0.238 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well MW-22-153

RACER Lansing

Figure F-80



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

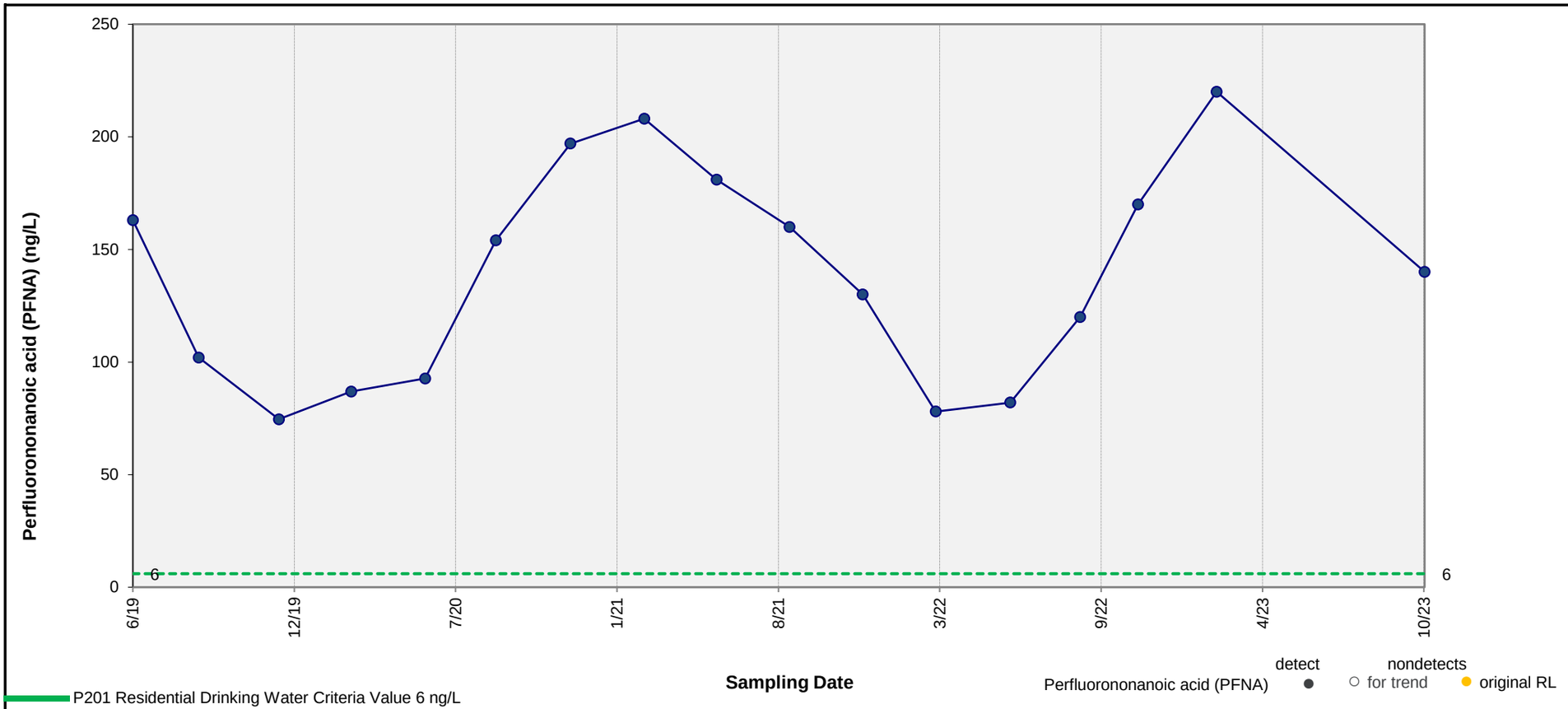
p value = 0.010 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well P2-MW-04

RACER Lansing

Figure F-81



Results of Mann-Kendall Test for Trend: **No Significant Trend**

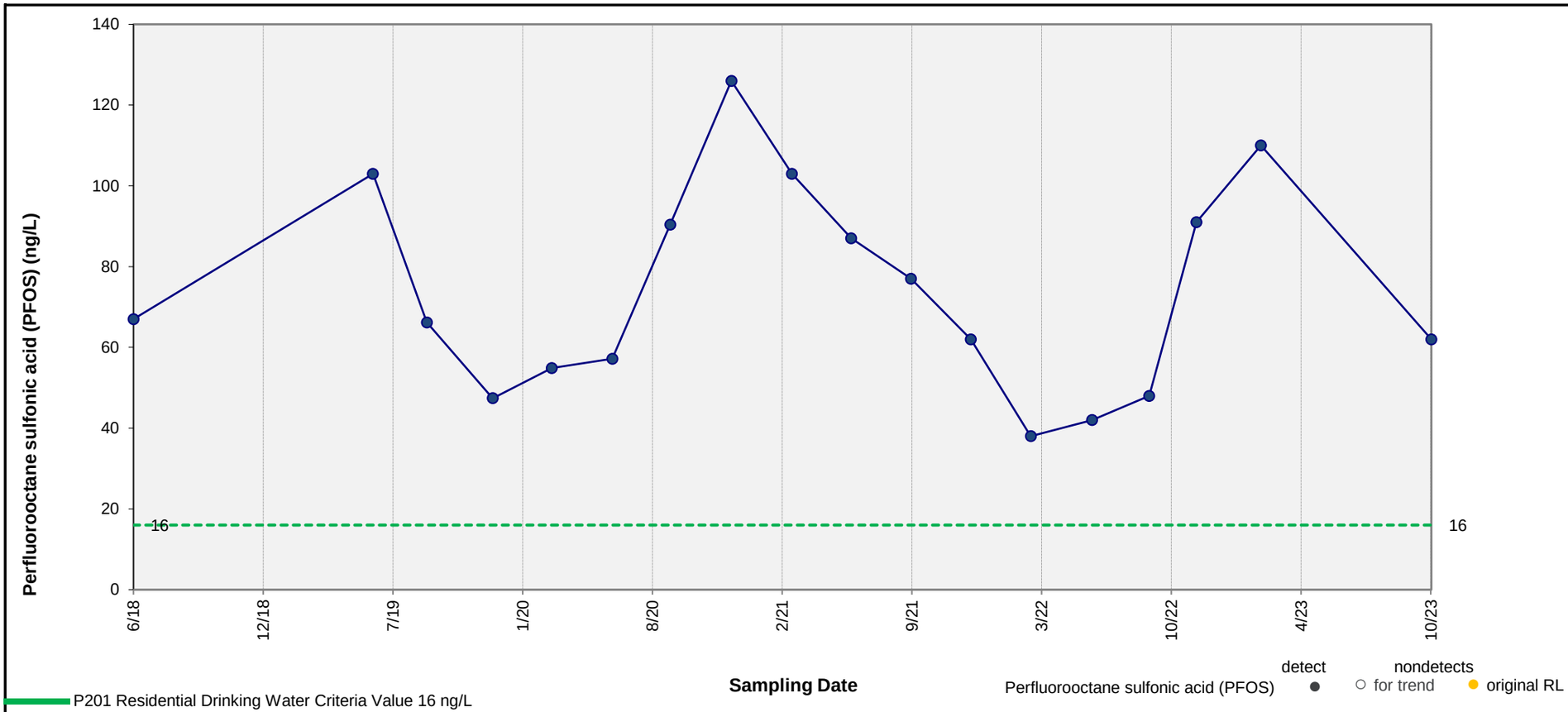
p value = 0.217 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorononanoic acid (PFNA) in Well P6-SB-07

RACER Lansing

Figure F-82



Results of Mann-Kendall Test for Trend: **No Significant Trend**

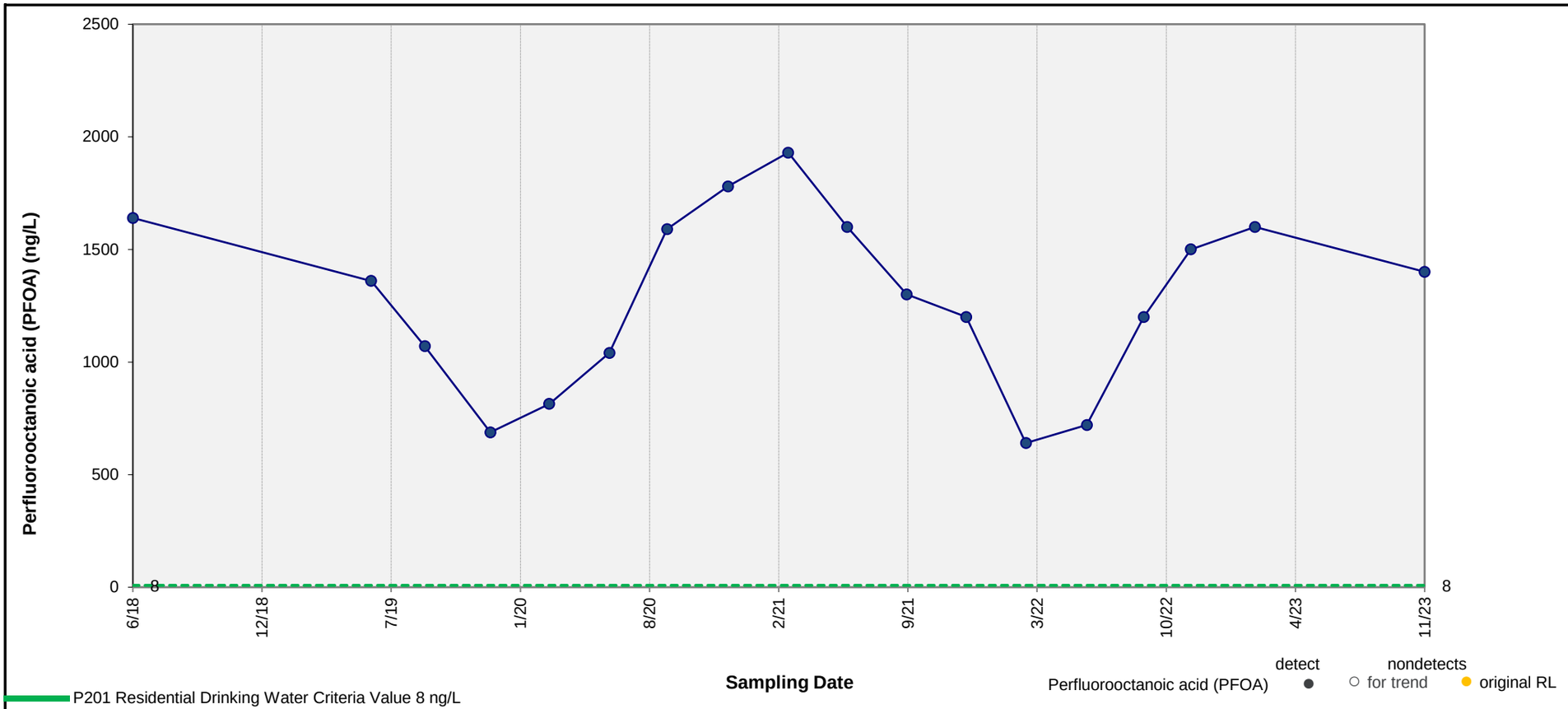
p value = 0.410 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well P6-SB-07

RACER Lansing

Figure F-83



Results of Mann-Kendall Test for Trend: **No Significant Trend**

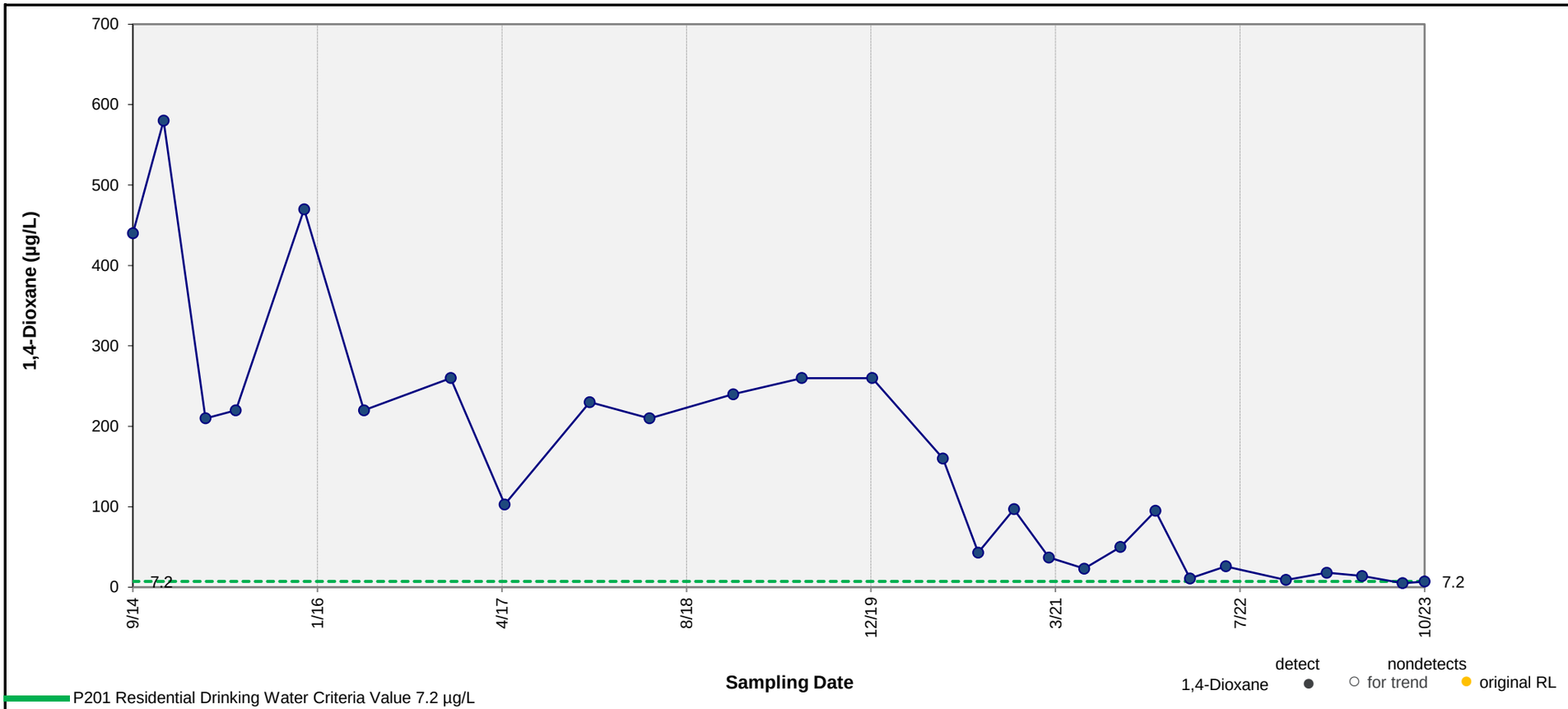
p value = 0.470 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well P6-SB-07

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Figure F-84



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

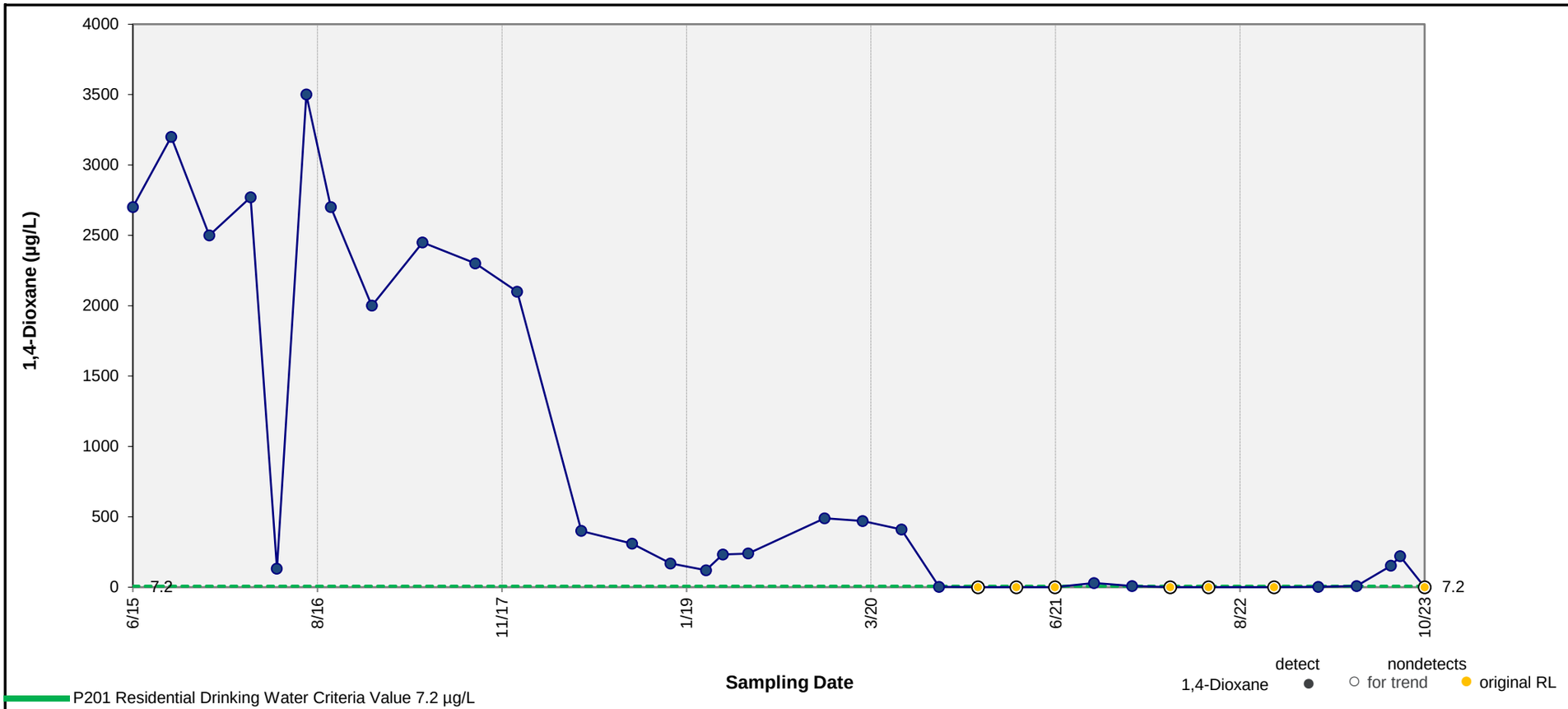
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well PW-14-02

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Figure F-85



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

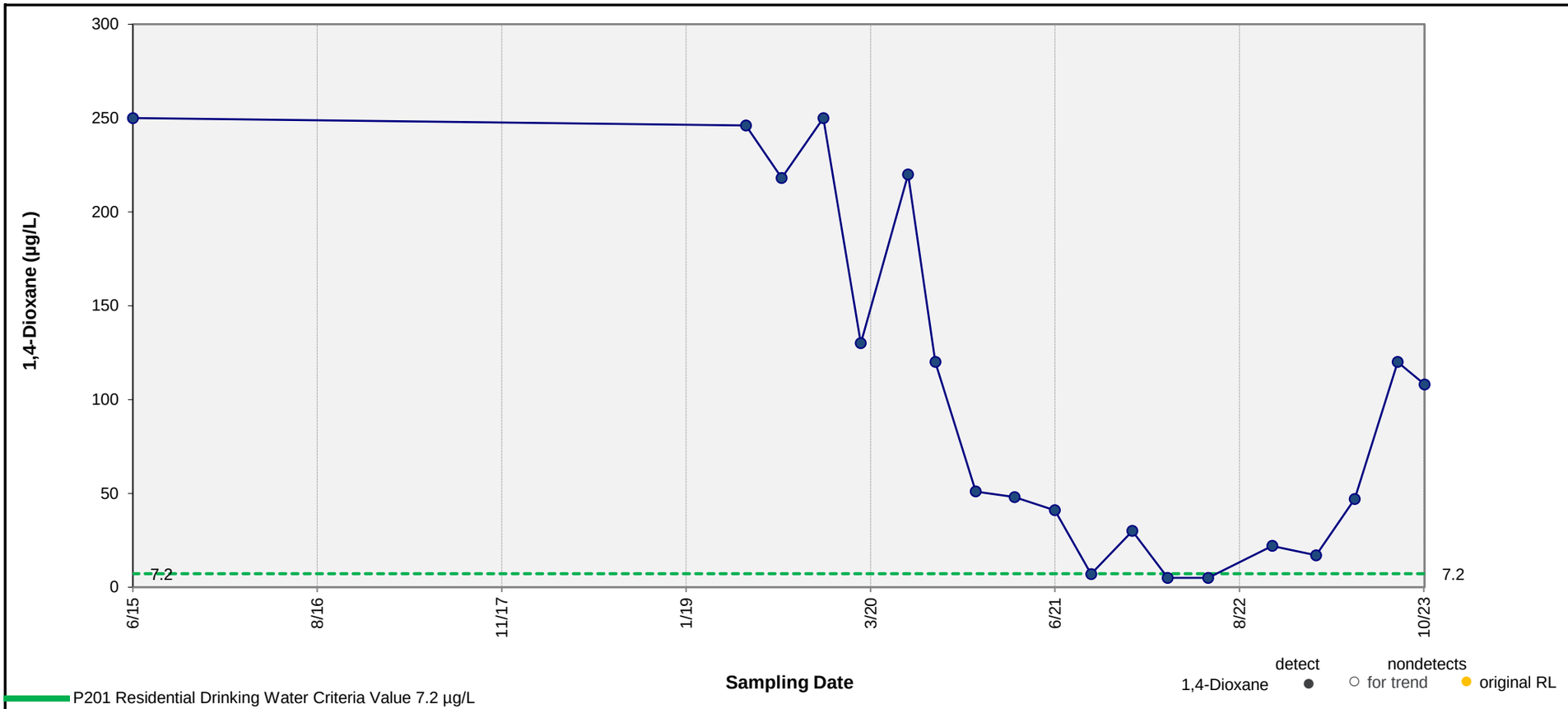
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well TW-14-02

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Figure F-86



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

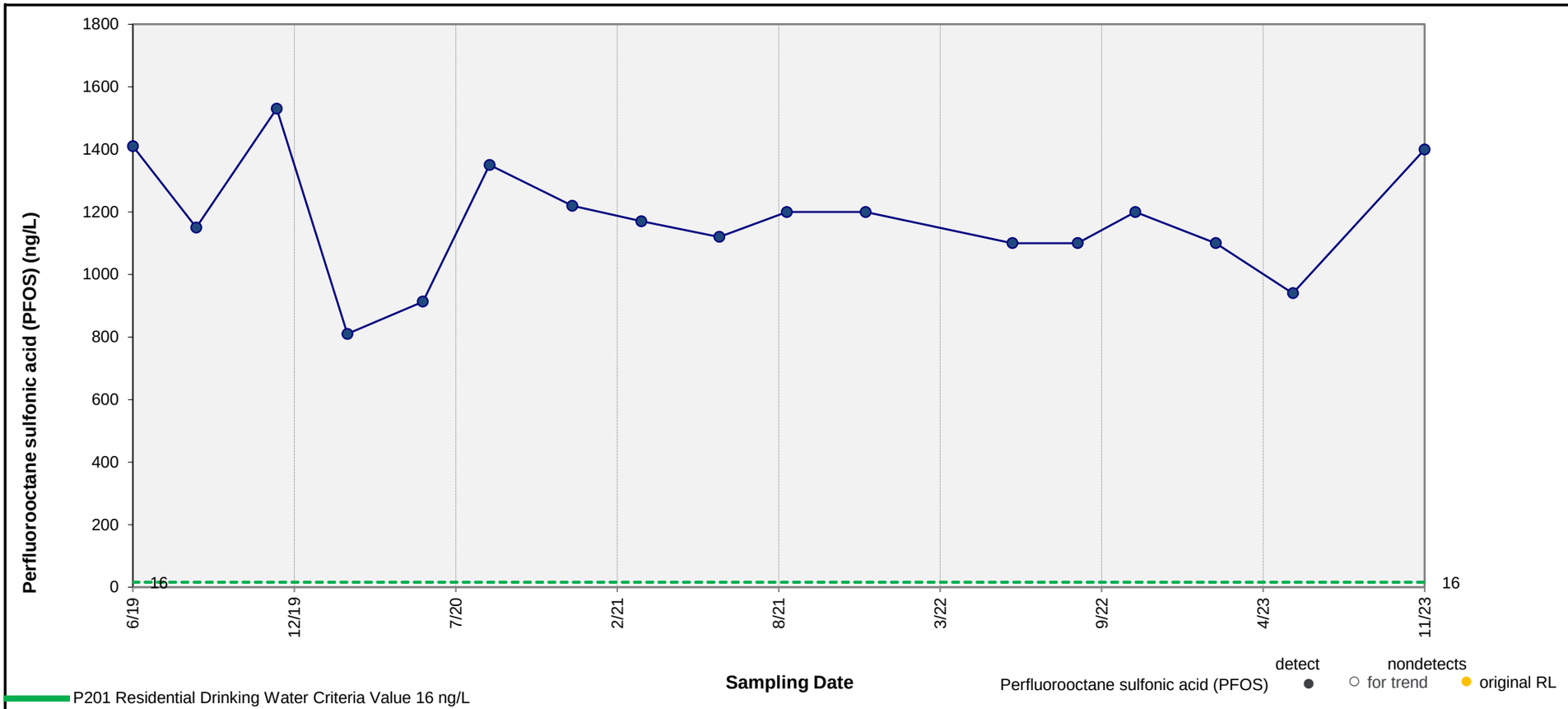
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – 1,4-Dioxane in Well TW-15-11

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Figure F-87



Results of Mann-Kendall Test for Trend: **No Significant Trend**

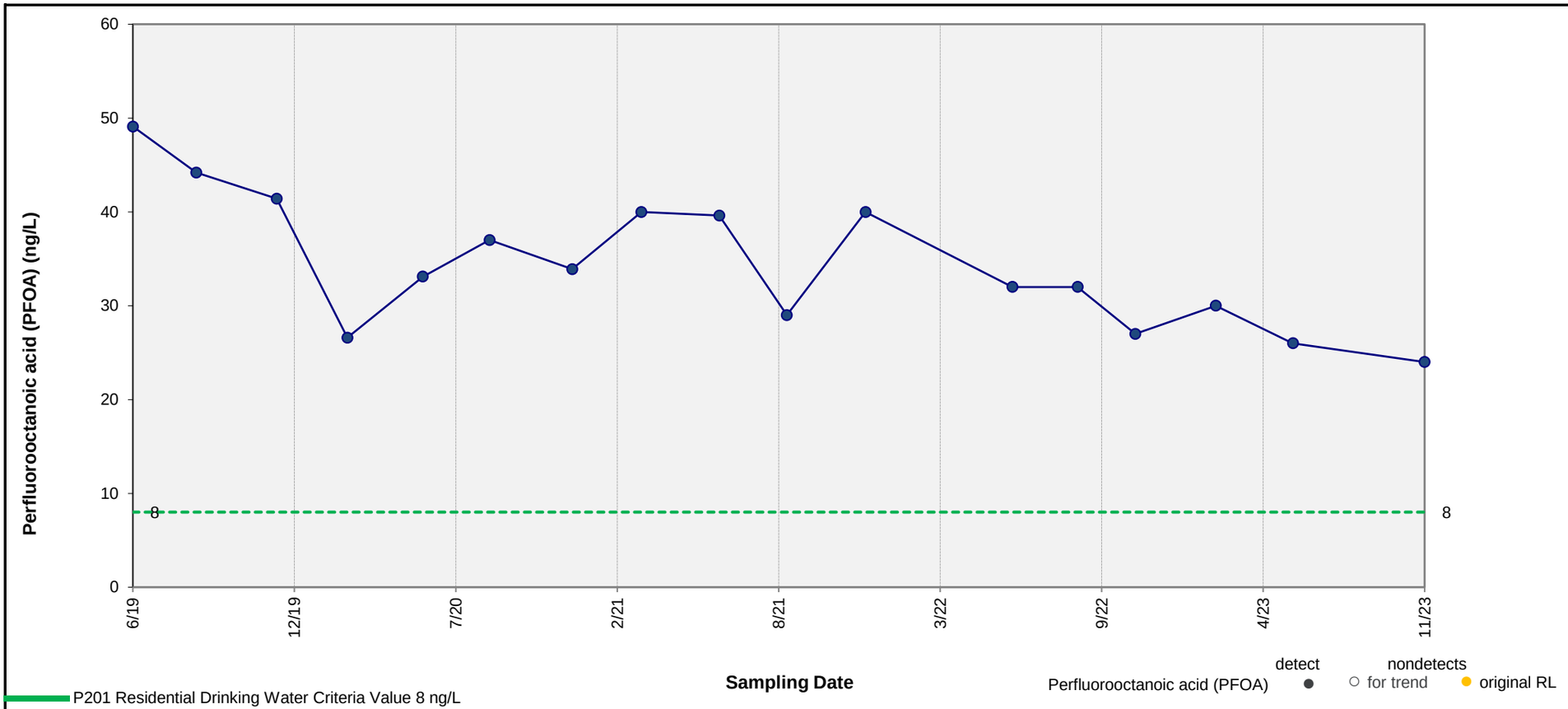
p value = 0.170 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctane sulfonic acid (PFOS) in Well UNK-15

RACER Lansing

Figure F-88



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% confidence level).

ARCADIS

Concentration vs. Time Plot – Perfluorooctanoic acid (PFOA) in Well UNK-15

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Figure F-89

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